Q.1  Multiple choice questions:

a) What type of computer chips are said to be volatile?
   i) RAM    ii) ROM
   iii) DRAM iv) SRAM

b) Which symbol represent top down approach?
   i) ↓
   ii) ↑
   iii) ←→
   iv) ↞

c) The amount of data that a disk may contain is called:
   i) Volume ii) Size
   iii) Storage capacity iv) Primary storage

   d) Assemblers convert the source code into:
Q.2 Explain the following:

i) Object code  
i) Executable code  

iii) Binary code  
iv) Codable code

e) ROM and RAM are secondary storage units.  
i) True  
ii) False  

iii) Both  
iv) None of the above

f) Which of the following form a decision table?  
i) Action stub  
ii) Condition stub  

iii) Both i) and ii)  
iv) None of the above

g) The brain of any computer system is:  
i) ALU  
ii) Memory  

iii) CPU  
iv) CU

h) Dot-matrix is a type of:  
i) Tape  
ii) Printer  

iii) Disk  
iv) Bus

i) Where would you find the letters QUERTY?  
i) Mouse  
ii) Keyboard  

iii) Printer  
iv) Scanner

j) What does a light pen contain?  
i) Refillable ink  
ii) Pencil lead  

iii) Light sensitive elements  
iv) Diodes.

2x10

PART-A
a) Super computers.
b) Light pen.
c) Structured programming.
d) Debugging.

Q.3
a) Draw the block diagram of computer. Which component of a computer is generally called brain of a computer and why? Describe the functions of the distinct part of this component.

b) What are the various characteristics of a computer?

Q.4
a) Explain the difference between:
   i) Printers and plotters
   ii) Impact and non-impact printers.

b) Write the applications of computers in:
   i) Sports
   ii) Weather.

PART-B
Q.5
a) What do you understand by an algorithm? What are the various measures that needs to be taken care when designing an algorithm? Illustrate with the help of an example.

b) Write an algorithm to print the factorial of a number inputted through the keyboard.

Q.6
a) Which technique is popularly known as modular approach of programming? Explain its concept and its type with a suitable example. Also mention its advantages and disadvantages.
b) Explain the various symbols used in preparing a flowchart.

10

Q.7 Write an algorithm and also draw a flowchart to reverse a number entered by the user. Also perform the dry run to illustrate the flow and the results.

20
End Semester Examination, May 2016

BCA -First Semester

ELEMENTS OF MATHEMATICS (BCA-102)

Time: 3 hrs
Max Marks: 75

No. of pages: 2

Note: Attempt FIVE questions in all; taking at least ONE question from each Unit. Q.1 is compulsory. All questions carry equal marks.

Q.1  a) Write down all the subsets of \{1, 3, 5\}

b) Define a power set.

c) What do you mean by equivalence relation?

d) Find the 6th term of sequence: 2, 4, 6, 8, __

e) Define divergence in vector calculus. 1½x5

f) Define the following:

i) A field.

ii) First order differential equation.

iii) Addition rule of probability.

iv) Cardinality of a set.

v) Cartesian product of sets. 1½x5

UNIT-I

Q.2  a) In a group of 50 persons each can read atleast one of two languages English or Hindi. If 30 persons can read English and 25 can read Hindi, find the number of
person who can read both the languages.

b) Set $A = \{1, 2, 3, 4\}$, then show that: $R = \{(1,1), (1,2), (2,2), (2,3), (3,3), (4,4)\}$ is reflexive but not symmetric and not transitive.

Q.3 a) Find the domain and range of the following function: $y = |x|$

b) How many terms of the sequence $-2, 3, 8, 13, \ldots$ make the sum 568.

UNIT-II

Q.4 a) Evaluate: $\sin 105^{\circ} + \cos 105^{\circ}$

b) Prove that: $4 \sin A \sin (60^{\circ} - A) \sin (60^{\circ} + A) = \sin 3A$

Q.5 a) A study showed that 65 percent of managers had some business education and 50 percent had some engineering education. Furthermore, 20 percent of the managers had some business education but no engineering education. What is the probability that a manager has some business education, given that he has some engineering education?

b) Show that: $\log 2 + 16 \log \frac{16}{15} + 12 \log \frac{25}{24} + 7 \log \frac{81}{80} = 1$

UNIT-III

Q.6 a) Evaluate: $\lim_{x \to 1} \frac{x^3 + 3x^2 - 6x + 2}{x^3 + 3x^2 - 3x - 1}$
Q.7  
\[ f(x) = \begin{cases} 
\frac{x^2 - 4}{x - 2}, & x \neq 2 \\
K, & x = 2 
\end{cases} \]

b) Differentiate w.r.t. \( x \) :
\[ \frac{\sqrt{a + x} - \sqrt{a - x}}{\sqrt{a + x} + \sqrt{a - x}} \]

Q.7  
a) For what value of \( K \) is the following function continuous at \( x = 2 \) :

b) Find \( \frac{dy}{dx} \) if \( (x^2 + y^2) = xy \)

**UNIT-IV**

Q.8  
a) Evaluate:
\[ \int \frac{\sin^3 x + \cos^3 x}{\sin^2 x \cdot \cos^2 x} \, dx \]

b) Solve the differential equation:
\[ \frac{1}{x} \frac{dy}{dx} = \tan^{-1} x \]

Q.9  
a) Solve the differential equation:
\[ \frac{dy}{dx} = \frac{y - x}{x + y} \]

b) What is Algebraic structure? Explain groups and rings with examples.
End Semester Examination, May 2016

BCA - First Semester

ELEMENTS OF MATHEMATICS (BCA-102-CB)

Time: 3 hrs

Max Marks: 100

No. of pages: 2

Note: Attempt FIVE questions in all; Q.1 is compulsory. Attempt any TWO questions from Part A and TWO questions from Part B. Each question carries equal marks.

Q.1
a) Define square matrix, scalar matrix transpose of matrix and upper-triangular matrix.
b) Discuss the formulae used of permutations and combinations.
c) Explain the Maclaurin’s theorem along with a suitable example.
d) What are addition formulae in trigonometry?
e) Explain differentiation of product of two functions.

4x5

PART-A

\[
\begin{bmatrix}
1 & 0 & 2 \\
0 & 2 & 1 \\
2 & 1 & 0
\end{bmatrix}
\begin{bmatrix}
1 \\
1 \\
1
\end{bmatrix} = 0
\]

Q.2
a) Find the value of \( x \) such that 10

b) Solve the following equations using Cramer’s rule:

\[
\begin{align*}
x + y - z &= -2 \\
3x + 2y + 3z &= 13 \\
2x + 7y + 4z &= 31
\end{align*}
\]

10
Q.3  a) Simplify: \[ \frac{9 \left(4^x\right)}{16^{x+1} - 2^{x+1} \times 8^x} \]

b) Find the value of: \[ \frac{2 \log 6 + 6 \log 2}{4 \log 2 + \log 27 - \log 9} \].

Q.4  a) Find the coefficient of \( x^9 \) in the expansion of \( \left[ x + \frac{2a}{x} \right]^{15} \).

b) In how many ways can 5 men and 4 women be seated in a row so that the women occupy the even places?

c) Find the number of ways of selecting 9 balls from 6 red balls, 5 white balls and 5 blue balls, if each selection consists of 3 balls of each colour.

5

PART-B

Q.5  a) Prove that: \( \sqrt{\frac{1 + \sin A}{1 - \sin A}} = \sec A + \tan A \).

b) Prove that: \( 4 \sin^3 60^\circ + 4 \cos^3 30^\circ = 3 \sin 60^\circ + 3 \cos 60^\circ \).

Q.6  a) If \( f(x) = \begin{cases} \frac{x^2 - 1}{x - 1} & \text{when } x \neq 1 \\ \frac{1}{2} & \text{when } x = 1 \end{cases} \) Then show that \( f(x) \) is continuous at \( x = 1 \).

b) Differentiate the following function \( w.r.t. \ x: \) \[ \frac{1 - \sqrt{x}}{1 + \sqrt{x}} \].
Q.7  

a) Expand $a^x$ and $e^x$ in powers of $x$ by Maclaurin’s theorem.

10

b) If $f(x) = 2x^2 + 2x + 10x - 11$, calculate the value of $f\left(\frac{10}{9}\right)$ by the application of Taylor’s series.

10
End Semester Examination, May 2016

BCA -First Semester

HARDWARE INTERFACES (BCA-103-CB)

Time: 3 hrs

Max Marks: 100

No. of pages: 2

Note: Attempt FIVE questions in all; Q.1 is compulsory. Attempt any TWO questions from Part A and TWO questions from Part B. Each question carries equal marks.

Q.1 Multiple choice questions:

a) Which of the following is not real security and privacy risk?
   i) Hackers
   ii) Spam
   iii) Viruses
   iv) Identity theft

b) Kilobyte equals to how many bytes?
   i) 1000
   ii) 1024
   iii) 100
   iv) 1008

c) Which of the following is an advantage of using a Local Area Network (LAN)?
   i) Protects against virus infection
   ii) Shared resources
   iii) Data Security
   iv) Prevents Computer misuse

d) Which operation is not performed by computer?
PART-A

Q.2 a) Write the different types of printer in detail.
b) How can one do troubleshooting for a printer? Write any five issues which may cause printer not to print the data.  

10

Q.3  
a) Explain the different types of memory used in personal computer.  

10  
b) What is the data recording principle of CD-ROM?  

5  
c) Write a short note on parallel port.  

5

Q.4  
a) Write the features and properties of Intel i3, i5 and i7 processors.  

10  
b) Write in detail the working of virtual memory. Also give the diagram for the same.  

10

PART-B

Q.5  
a) What do you mean by BIOS? Write the complete BIOS sequence step-by-step.  

10  
b) Explain the working of SMPS.  

10

Q.6  
a) Explain the concept of SCSI.  

10  
b) Explain the working of peripheral components interconnect (PCI).  

10

Q.7  
a) What is the utility of anti-virus? Name any five anti-virus programmes and write about them in brief.  

10
b) Write short notes on:

i) Spyware.

ii) Trojan Horse.

5x2
Q.1 Multiple choice questions:

a) Which of the following can’t be checked in a switch-case statement?
   
   i) Character
   ii) Integer
   iii) Float
   iv) Return

b) Which is of the following is not logical operator?

   i) &
   ii) &&
   iii) ||
   iv) !

c) Which header file should be included to use function like malloc() calloc()

   i) Memory.h
   ii) Stdlib.h
   iii) sking.h
   iv) dos.h

d) Macro calls and function calls work exactly similarly.
i) True
ii) False

e) C Language was created in year.
i) 1967
ii) 1980
iii) 1972
iv) 1976

f) The keyword used to transfer control from a function back to the calling function is:
i) Switch
ii) goto
iii) go back
iv) return

g) A function can't be defined inside another function.
i) True
ii) False

h) If return type for a function is not specified, it defaults to:
i) int
   ii) float
   iii) double
   iv) char

i) Function can be called by:
i) Value
   ii) Reference
   iii) Number
   iv) Return statement

j) __________ bitwise operator is suitable for checking whether a particular bit is on or off.
i) &&
   ii) &
   iii) !
   iv)  

$1 \frac{1}{2} \times 10$
Answer the following (in brief):

k) Who develop C language and where?

l) What is array?

m) What is keyword?

n) What do you mean by pointer?

o) What is constant?

1x5

PART-A

Q.2 a) What are various datatypes available in C language? Explain them in detail. 10

b) Explain the structure of C program. 10

Q.3 a) What do you mean by array? What are various advantages and disadvantages of array? 10

b) Differentiate between:
   i) While and do-while.
   ii) Break and continue. 5x2

Q.4 Explain the following string functions with an examples:
   a) strcpy()
   b) strrev()
   c) strlen()
   d) strcat() 20

PART-B

Q.5 a) Explain the following:
i) Function prototype.
ii) Function definition.
iii) Function calling.

b) What do you mean by recursion?

Q.6 a) Differentiate between:
   i) Local and global variable.
   iii) Structure and union.

b) Write a program to find the factorial of a number using recursion.

Q.7 a) What are various storage classes available in C language?

b) Explain the purpose of array of structure with the help of an example.
End Semester Examination, May 2016

BCA -First Semester

PC SOFTWARE (BCA-104)

Time: 3 hrs

Max Marks: 75

No. of pages: 1

Note: Attempt FIVE questions in all; taking at least ONE question from each Unit. 
Q.1 is compulsory. All questions carry equal marks.

Q.1  a) The cell reference for cell range of G2 to M12 is _________.

b) The key F12 opens a __________.

c) PowerPoint presentations are widely used as _________.

d) Which shortcut key inserts a new slide in current presentation?

e) MS-Word is __________.

f) The _________ or typeface, defines the appearance and shape of letters, numbers and special characters.

g) If a computer is turned off or electrical power is lost, the document remains stored in the computer’s memory. (True/ False)

h) A _________ is a specific location on a disk.

i) The purpose of scroll bar is _________.

j) GUI stands for __________. 

1½x10

UNIT-I

Q.2 What is an operating system? Mention the types and explain them too.

15

Q.3 Explain the function of the following:
UNIT-II
Q.4 Explain the steps involved for each of the following in MS-Word:
   a) Changing document margins.
   b) Mirror margins.
   c) Setting page margins.

Q.5 What are the steps for recording a macro in MS-Word? How can one run a recorded macro in MS-Word?

UNIT-III
Q.6 a) Explain any four functions available in MS-Excel.
    b) What is the simplest way to create a table to sort data in MS-Excel?

Q.7 a) What are worksheets and how can one add/remove worksheets in MS-Excel?
    b) How can one add cells, rows or columns in MS-Excel?
    c) How can one make space for text in a cell where the text is longer than the cell size?

UNIT-IV
Q.8 a) Discuss the various types of views available in MS-PowerPoint.
    b) Write the benefits of PowerPoint presentation.
Q.9 Write the steps involved in creating a presentation using PowerPoint to include the following tasks:

a) Adding clip art.
b) Formatting paragraphs.
c) Slide importing.
d) Change the speed of transition.
e) Text in form of columns.

End Semester Examination, May 2016
Q.1  a) Which of the following gates would output 1 when one input is 1 and other input is 0?
    i) OR gate       ii) AND gate
    iii) NAND gate   iv) both i) and ii)

b) In computer, subtraction is carried out generally by:
    i) 1’s complement method       ii) 2’s complement method
    iii) Signed magnitude method   iv) BCA subtraction

c) Cache memory works on the principle of:
    i) Locality of data           ii) Locality of memory
    iii) Locality of reference    iv) Locality of reference and memory

d) The circuit which stores one bit of data is known as:
    i) Encoder          ii) OR gate
    iii) Flip-Flop      iv) Decoder

e) The half-adder performs:
    i) Decimal addition operation for 2 decimal inputs.
    ii) Binary addition operation for 2 binary inputs.
    iii) Decimal addition operation for 2 binary outputs.
    iv) None of the above.
f) If a logic gate has four inputs, then total number of possible input combinations is:
   i) 4  
   ii) 8  
   iii) 16  
   iv) 32

g) The function of multiplexer is:
   i) To decode information.  
   ii) To select 1 out of N input data sources and to transmit it to a single channel.  
   iii) To transmit data as N lines.  
   iv) To perform serial to parallel conversions.

h) The logical operations are implemented using ___________ circuits.
   i) Bridge  
   ii) Logical  
   iii) Combinational  
   iv) Gate

i) Cache memory acts between:
   i) CPU and RAM  
   ii) RAM and ROM  
   iii) CPU and hard disk  
   iv) None of the above

j) K maps for 4 variables has how many minterms:
   i) 4  
   ii) 8  
   iii) 12  
   iv) 16  

k) Write short notes on:
   i) Half subtractor  
   ii) Weighted codes

PART-A

Q.2 a) Convert the following:
   i) \((A \; D \; F \; E)_{16} = ( \quad )_2 = ( \quad )_{10} = ( \quad )_8\)
   ii) \(( \quad )_{16} = (7 \; 9 \; 9 \cdot 9)_{10} = ( \quad )_2 = ( \quad )_8\)

b) What are Hamming codes? Explain with an example.
Q.3  
a) Explain all the basic gates with their truth table.  

b) Why NAND and NOR are called universal gates? Explain.

Q.4  
a) Simplify the following in their SOP form:

i) \( F(a, b, c, d) = \Sigma (1, 3, 5, 6, 11, 12, 14, 15) \)

ii) \( F(w, x, y, z) = \Sigma (1, 4, 5, 6, 9, 13, 15) \)

b) Find the canonical form of:

\[ F(A, B, C) = \Pi (1, 2, 4, 5, 6) \]

Q.5  
a) What are combinational circuits? Draw and explain a full adder and full subtractor.

b) What are decoders? Draw a 5 × 32 decoder using 4 (3 × 8) decoder and one 2 × 4 decoder.

Q.6  
a) What are shift registers? Draw and explain the types of shift registers.

b) Draw a 4 bit binary counter.

Q.7  
What is cache memory? Explain the different types of mapping in detail.

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End Semester Examination, May 2016
BCA – Second Semester

DATA STRUCTURES (BCA-201)

Time: 3 hrs  Max Marks: 75
No. of pages: 1

Note: Attempt FIVE questions in all; taking at least ONE question from each UNIT. Q.1 is compulsory. All questions carry equal marks.

Q.1 Fill in the blanks:

a) FIFO stands for ___________.
b) Array is a ___________ data structure.
c) Sparse matrix contains maximum ___________ as its element.
d) Binary search algorithm can't be applied to ___________ array.
e) The situation when in a link list start = NULL is known as ___________.

State whether the following statements are TRUE or FALSE:

f) Stack follows LIFO structure.
g) The degree of root node is always zero.
h) Array can consist homogenous elements only.
i) Push and pop are the operation of stack.
j) Single link list can’t be traversed in reverse direction.

UNIT-I

Q.2 What do you mean by data structure? Explain different data structures in details. 15

Q.3 What do you understand by stack? Write algorithms for different operations of stack. 15

UNIT-II
Q.4 What do you mean by link list? Explain different operations performed on single link list using an algorithm.

Q.5 Explain following terms by considering a BST:
   a) Traversing
   b) Degree
   c) Height of a BST
   d) Child node
   e) Leaf node
   f) Depth of a tree
   g) Internal node

UNIT-III

Q.6 Write an algorithm for bubble sort. Also explain it with the help of an example.

Q.7 Sort following numbers (10, 19, 11, 26, 23, 78, 62, 7, 43, 81, 15) using heap sort.

UNIT-IV

Q.8 Explain the following:
   a) Field.
   b) Record.
   c) File/Database.

Q.9 What do you understand by hashing? Explain various hashing functions in detail.

End Semester Examination, May 2016
BCA – Second Semester

MATHEMATICAL FOUNDATION OF COMPUTER SCIENCE (BCA-202)

Time: 3 hrs  Max Marks: 75
No. of pages: 3

Note: Attempt FIVE questions in all; taking at least ONE question from each UNIT.
Q.1 is compulsory. All questions carry equal marks.

Q.1  a) Let \( P = \{a, b, c\} \) and \( Q = \{k, l, m, n\} \). Determine the Cartesian product of \( P \) and \( Q \).

b) Consider the relation ‘≤’ on the set \( A = \{2, 3, 4, 5\} \). Determine its inverse.

c) Let \( R \) be a relation on set \( A = \{1, 2, 3, 4\} \) defined by \( R = \{(1, 1), (2, 2), (3, 3), (4, 4), (4, 3), (4, 2), (4, 1), (3, 2), (3, 1)\} \). Find the matrix and directed graph of relation \( R \).

d) Let \( A = \{2, 3, 4\} \) and \( B = \{a, b, c\} \) and a function \( f \) is \( f = \{(2, a), (3, b), (4, b)\} \). Find domain, co-domain, and range of the function.

e) Find the incidence matrix for the following graph:

f) Determine the value of expression tree:

\[
\begin{align*}
\text{Tree: } & - \\
\text{Nodes: } & 2, 3, 4, 5, 10, 12, 7, 4, 5, 10, 12, 4 \\
\text{Operations: } & \times, +, - \\
\text{Levels: } & 3, 2, 1 \\
\text{Expression: } & - (\times (2, + (5, \div (10, \div (4, 5, 12, 4))), 7) ) \\
\end{align*}
\]

\[ a_r^4 + 3a_r^3 + 6a_r^2 + 4a_r = 0. \]

h) Determine the Hasse diagram of the partial order having directed graph.
i) Minimize the following Boolean expression using K-map.

\[ f(A, B) = \overline{A}B + BA \]

j) Let \( A = \{(1, 2)\} \), and \( R \) is relation defined by \( R= \{(1, 1), (1, 2), (2, 2)\} \). Is the relation reflexive or irreflexive? Justify your answer.

**UNIT-I**

Q.2  a) By using Mathematical induction prove that

\[ 1^1 + 2^3 + 3^3 + \ldots + n^3 = \left[ \frac{n(n+1)}{2} \right]^2 \]

b) Let \( U = \{1, 2, 3, 4, 5, 6, 7, 8, 9\} \) and suppose that \( A = \{1, 2, 3, 4, 5\} \), \( B = \{4, 5, 6, 7\} \), \( C = \{5, 6, 7, 8, 9\} \), \( D = \{1, 3, 5, 7, 9\} \). Find

i) \( A \cup B \)

ii) \( A \cap B \)

iii) \( A' \)

iv) \( C \setminus D \)

v) \( (C \setminus D)' \)

vi) \( A \times B \)

vii) \( (A \cup B) \setminus (C \cup D) \)

**Q.3**  a) Among the first 500 positive integers:

i) Determine the integers which are not divisible by 2 nor by 3, nor by 5.

ii) Determine the integers which are exactly divisible by one of them.

b) Consider the functions \( f \) and \( g \) such that

\[ f(x) = x + 2, \ x \in R \]
\[ g(x) = x^2, \ x \in R \]

Find the composition function \( g \circ f \) and \( f \circ g \).

**UNIT-II**

Q.4  a) Find the combinational circuit corresponding to each of the following Boolean expression:
b) Consider a lattice \((L, \leq)\) as shown below, where \(L = \{1, 2\}\). Determine the lattice \((L^2, \leq)\), where \(L^2 = L \times L\).

Q.5

a) Minimize the 4 variable logic function using K-map.

\[
f(A, B, C, D) = AB \bar{C}D + \bar{A}BCD + \bar{A}B\bar{C} + AB\bar{D} + A\bar{C} + A\bar{B}C + \bar{B}
\]

b) Consider the lattice \(L = \{1, 2, 3, 4, 5\}\). Determine all the sub-lattice with 3 or more elements.

\[
\begin{align*}
&5 \\
&2 \quad 3 \quad 4 \\
&1
\end{align*}
\]

UNIT-III

Q.6

a) Solve the difference equation.

\[2a_r - 5a_{r-1} + 2a_{r-2} = 0\], and find particular

Solution such that \(a_0 = 0\) and \(a_1 = 1\).

b) Describe all the four cases to find the solution of linear homogeneous difference equation.

Q.7

a) Solve the difference equation \(a_r - 7a_{r-1} + 10a_{r-2} = 0\) satisfying the conditions \(a_0 = 0\), \(a_1 = 6\).

b) If the points (3, 3), (1, k) and (2, 0) are collinear; find \(K\).

UNIT-IV
Q.8  a) Draw the unique binary tree when in-order and preorder traversal of the tree is given as follows:

<table>
<thead>
<tr>
<th>In-order</th>
<th>B</th>
<th>A</th>
<th>D</th>
<th>C</th>
<th>F</th>
<th>E</th>
<th>J</th>
<th>H</th>
<th>K</th>
<th>G</th>
<th>I</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preorder</td>
<td>A</td>
<td>B</td>
<td>C</td>
<td>D</td>
<td>E</td>
<td>F</td>
<td>G</td>
<td>H</td>
<td>J</td>
<td>K</td>
<td>I</td>
</tr>
</tbody>
</table>

b) For the tree shown below:

   i) List the children of each node.

   ii) List the siblings.

   iii) Find the depth of each node.

   iv) Find the level of each node.

Q.9  Find the shortest path between a and z in the graph.
End Semester Examination, May 2016
BCA - Second Semester
DATA STRUCTURES USING 'C' (BCA-203-CB)

Time: 3 hrs
Max Marks: 100

No. of pages: 2

Note: Attempt FIVE questions in all; Q.1 is compulsory. Attempt any TWO questions from Part A and TWO questions from Part B. Each question carries equal marks.

Q.1 Multiple choice questions:

a) A tree in which, for every node, the difference between the height of its left subtree and right subtree is not more than one is _________.
   i) AVL  ii) Complete binary  iii) B Tree  iv) None of the above

b) A linear list from which elements can be added or removed from either end is called _________.
   i) Stack  ii) Queue  iii) Deque  iv) None of the above

c) To implement sparse matrix dynamically, the following data structures is used:
   i) Trees  ii) Graphs  iii) Priority Queue  iv) Linked list

d) Which of the following can be used as a criteria for classification of data structure used in language processing?
   i) Nature of a data structure.  ii) Lifetime of a data structure.  iii) Purpose of a data structure.  iv) All of the above.
e) Which of the following is not a logical data structure?
   i) Tree  ii) List  iii) Stack  iv) Chain

f) What are the minimum number of queue needed to implement priority queue?
   i) 2  ii) 3  iii) 9  iv) None of the above

g) How many different trees are possible with 7 nodes?
   i) 121  ii) 122  iii) 123  iv) 128

State whether the following statements are TRUE or FALSE:

h) Recursive procedures are implemented by using stacks data structure.
i) The prefix form of an infix expression A+B-C*D is -+AB*CD.
j) The smallest element of an array is called lower bound.

2x10

PART-A

Q.2  a) What is an array? Discuss the various operations that are allowed on array data structure. Discuss the formula for calculating the address of any element of two-dimensional array.

10

b) Define: data structure, space-complexity and sparse matrices.

10

Q.3  Write an algorithm to convert infix expression to postfix expression. Convert the following infix expression into postfix expression:

(1 + 2 ↑ 3)/(5 − 4) + 6 . Show each step.

20

Q.4  a) Write an algorithm to search a particular data in a singly linked list.

10

b) Write an algorithm to insert and delete a node from doubly linked list.

10
PART-B

Q.5  
a) What is threaded binary tree? Explain with the help of an example. 
10

b) A binary tree has 6 nodes. Its inorder and preorder traversal’s node sequence are:

Inorder : DBEACF
Preorder : ABDECF

Draw the tree and show each step. 
10

Q.6  
a) Find the minimum spanning tree of following graph:

Use Kruskal algorithm and show each step. 
10

b) Find the incidence matrix of graph:
c) Define:

i) Degree of directed graph.

ii) Connected graph.

Q.7 a) Describe Insertion Sort algorithm and trace the steps of insertion sort for the following data: 12, 19, 33, 26, 29, 35, 22.

b) Compare ‘linear search and binary search’.

End Semester Examination, May 2016
BCA - Second Semester

PROGRAMMING IN VISUAL BASIC (BCA-203)

Time: 3 hrs

Max Marks: 75

No. of pages: 1

Note: Attempt FIVE questions in all; taking at least ONE question from each Unit. Q.1 is compulsory. All questions carry equal marks.

Q.1 Fill in the blanks:

   a) __________ is an example of procedural language.
   b) __________ is one of the weaknesses of visual basic language.
   c) __________ and __________ are data types available in visual basic.
   d) Exit statement is used to __________.
   e) Control array can be created by __________.
   f) __________ options can be selected from a group of checkboxes.
   g) Local variables are always declared __________.
   h) Data report has __________ sections.
   i) __________ is the most important property of a textbox.
   j) __________ is an example of conditional statement in visual basic.

   1½x10

UNIT-I

Q.2 Explain the integrated development environment of visual basic in detail. 15

Q.3 Explain the following terms briefly:

   a) Properties window
UNIT-II

Q.4 Explain the following data types in visual basic:
   a) Integer
   b) Long
   c) Boolean

Q.5 Explain all the conditional statements available in visual basic with the help of examples.

UNIT-III

Q.6 Explain the following controls in VB:
   a) List box
   b) Option button
   c) Frame

Q.7 Explain the ways of creating a control array in visual basic with the help of examples.

UNIT-IV

Q.8 Explain the following terms briefly:
   a) Data control
   b) Menu
   c) Data grid control
Q.9 Explain in detail the method of creating a menu in visual basic.

15

End Semester Examination, May 2016

BCA – Second Semester
Q.1 a) Which of the following represents a relationship among a set of values?
   i) Row ii) Table iii) Field iv) Column

b) The tuples of the relation can be of __________ order.
   i) Any ii) Same iii) Sorted iv) Constant

c) In an E-R diagram, rectangle represents.
   i) Entity sets ii) Attribute iii) Database iv) Tables

d) Grant and Revoke are __________ statements:
   i) DDL ii) DCL iii) DML iv) None of these

e) The default data format in SQL is __________.
   i) DD-MON-YY ii) DD-MM-YY iii) DD-MM-YYY iv) MM-DD-YY

f) Manager’s salary details are hidden from the employee. This is __________.
   iii) External level data hiding. iv) None of the above.

g) Data security threats include __________.
   i) Hardware failure. ii) Privacy invasion.
   iii) Fraudulent manipulation of data. iv) All of the above.

h) A system is in a __________ state if there exists a set of transactions such that
   every transaction in the set is waiting for another transaction in the set.
   i) Idle ii) Waiting
   iii) Deadlock iv) Ready
i) SQL stands for __________.
   i) Structured query language.
   ii) Sequential query language.
   iii) None of the above.

j) What is DBMS?

PART-A

Q.2  a) Describe the architecture of a database system. Why database is desired to be an integrated one? 10

b) What are the advantages and disadvantages of DBMS? 10

Q.3  a) What is meant by data independence? State its importance in database technology. Discuss its types with example of each. 15

b) Explain the difference between a weak and a strong entity set. Why do we have the concept of weak entity type? 5

Q.4  a) Define with an example of each:
   i) Primary Key
   ii) Candidate Key
   iii) Alternate Key
   iv) Composite Key
   v) Foreign Key. 15

b) Write any two aggregate functions in SQL with format and example. 5

PART-B

Q.5  a) Define: BCNF, full dependency, transitive dependency, partial dependency. Give an example of each. 10

b) State by giving examples, the conditions that are necessary for a relation to be in 4 NF and 5 NF. 10
Q.6 What is deadlock? Discuss the necessary conditions for deadlock. Also describe the various methods for handling deadlock. Give an example of each method.  

Q.7 a) How security is achieved at database system level? Explain in brief.  
b) Discuss log-based and check-point schemas for data recovery.
Q.1 Fill in the blanks:
   a) Full form of ASCII is __________.
   b) Universal gates are ________ and __________.
   c) RISC is ________.
   d) DMA is ________.
   e) \((110011)_2\) in \((\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_)_8\) is __________.
   f) Boolean expression can be solved by ________ and ________.
   g) Types of asynchronous data transfer are ________ and ________.
   h) Instructions are stored in ________.
   i) Karnaugh map can be solved for ________, ________, and ________.
   j) \((348)_{10}\) can be converted in binary as ________.

UNIT-I

Q.2 Perform the following:
   a) Convert.
      \((126)_{10}=(\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_)_2=(\_\_\_\_\_)_8=(\_\_\_\_\_)_16\)
   b) \((\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_)_{16}+(EFG.F)_{16}=(\_\_\_\_\_)_{16}\)
   c) \((11011.10)_{2}-(11101.01)_{2}=(\_\_\_\_\_)_{2}\)

   5x3

Q.3 a) What are complements of a number system? Explain.
b) A 7 bit hamming code is received as 0110110. What is its correct code?

\[ 7^{\frac{1}{2}} \times 2 \]

**UNIT-II**

Q.4 Explain all the basic gates with their truth tables and symbols.

15

Q.5 Find the other canonical form of:

a) \[ F(A, B, C) = \pi (3, 4, 6, 7) \]

b) \[ F(X, Y, Z) = \sum (1, 3, 4, 6) \]

\[ 7^{\frac{1}{2}} \times 2 \]

**UNIT-III**

Q.6 Write are the different types of instructions. Explain instruction cycle in brief.

15

Q.7 Write short notes on:

a) Memory hierarchy.

b) Addressing modes.

15

**UNIT-IV**

Q.8 Explain the following:

a) Memory mapped I/O.

b) I/O interface.

15

Q.9 What are the various modes of data transfer? Explain strobe control based data transfer.

15
Note: Attempt **FIVE** questions in all; **Q.1 is compulsory**. Attempt any **TWO** questions from Part A and **TWO** questions from Part B. Each question carries equal marks.

Q.1 Answer the following questions in brief:
   a) How are nodes on the internet addressed?
   b) What is a Meta search engine?
   c) Describe in brief one internet routing protocol.
   d) What is an SQL injection attack?
   e) Describe one method of preventing password from being cracked. Also describe any one password cracking test that can be automated with tools. 4×5

**PART-A**

Q.2 a) Describe the internet architecture in terms of routers, end systems, ISPs and internet backbone. 10
   
   b) Describe the architecture of e-mail system. What is MIME? 10

Q.3 What purpose is served by the following in the internet?
   a) DNS.
   b) WWW.
   c) URL.
   d) Web Browser. 5×4

Q.4 a) What is the purpose of HTTP, DHCP and FTP in the internet protocol architecture? 10
   
   b) What are the various modes of connecting to the internet? Explain the role of modems in internet connectivity. 10

**PART-B**

Q.5 What do you mean by net etiquettes and online ethics? Describe the rules and guidelines that individuals should follow while using the internet services. 20
Q.6  
   a) What are the most common methods used by hackers to gain control of home computers?  

   b) Differentiate between passive and active scanning techniques.  

Q.7  
List and describe the categories under which cybercrimes may be classified. What preventive measures can be followed by net citizens for precautions against cybercrimes?
Q.1 Choose the correct option:

a) Exponential growth occurs when there is:
   i) A great environmental resistance
   ii) No environmental resistance
   iii) No biotic potential
   iv) A fixed carrying capacity

b) A population is a group of:
   i) Individual in a species
   ii) Species in a community
   iii) Communities in an ecosystem
   iv) Individuals in a family

c) Which gas out of following is found highest by volume in air?
   i) Nitrogen
   ii) Oxygen
   iii) Ozone
   iv) Methane

d) Taj Mahal is said to be suffering from 'Marble cancer'. What is marble cancer?
   i) Acid rain which corrodes marble.
   ii) Large number of fungus in Taj Mahal marble.
   iii) Yellowning of the marble on accounts of roof particles.
   iv) Smokes filling the Taj Mahal from adjoining industries.

e) The pyramid of numbers is inverted in the case of:
   i) Parasitic food chain
   ii) Grassland ecosystem
iii) Forest ecosystem
iv) Lake ecosystem

f) Identify the possible link A in the following food chain:

Plant → insect → frog → 'A' → Eagle

i) Cobra
ii) Parrot

iii) Rabbit
iv) Wolf

g) Tropic levels in ecosystem is formed by:
i) Only herbivores
ii) Only plants

iii) Only bacteria
iv) Organisms linked in food chain

h) A renewable exhaustible natural resource is:
i) Petroleum
ii) Coal

iii) Forest
iv) Minerals

i) Carbon dioxide content in atmosphere is:
i) 93%
ii) 0.5%

iii) 0.03%
iv) 0.001%

j) The woman starts taking the birth control pills on about day _____ of the cycle:
i) 1
ii) 5
iii) 10
iv) 14
v) 28

UNIT-I

Q. 2 a) Justify the statement that “Environmental studies should be must for all streams of students”.
b) Explain the role of an individual in conservation of natural resources.

Q.3 a) Differentiate between renewable and non-renewable sources of energy.

b) What are the advantages of making public aware about the environment?

UNIT-II

Q.4 a) What is an ecosystem? Explain the function and structure of an ecosystem.

b) Differentiate between producers, consumers and decomposers.

Q.5 a) What do you mean by pyramid in an ecosystem? Explain their significance with suitable examples.

b) How is a food chain different from a food web? Illustrate by giving an example.

UNIT-III

Q.6 a) How is pollution effecting the young generation of today’s?

b) What do you mean by waste land reclamation? Give its advantages.

Q.7 Write short notes on (any two):

a) Global warming.

b) Ozone layer depletion.

c) Nuclear accidents.

UNIT-IV
Q.8  
   a) List various reasons which led to population explosion.  
      5

   b) Why there is a need of family welfare programmes? Who are benefited by these  
      programmes?  
      5

Q.9  
   Illustrate the role of information technology in environment and human health.  
   10

End Semester Examination, May 2016

BCA – Second Semester

ENGLISH LANGUAGE PROFICIENCY-II (BCA-207)

Time: 3 hrs

Max Marks: 75

No. of pages: 4

Note:  Attempt ALL the questions.
Q.1 Pick the pronoun in each sentence.

a) Gary’s mom asked _______ to clean the garage.
   i) he  ii) him

b) A student at an all boys high school should be on _______ best behaviour.
   i) their  ii) his

c) Neither Mary nor _______ knew why the store was closed.
   i) I  ii) me

d) After school you and _______ must discuss a few things.
   i) I  ii) me

e) Everyone at the table has eaten _______ lunch earlier.
   i) his or her  ii) their

f) My nephew was crying and needed _______ diaper changed.
   i) his  ii) their

g) My son dropped his bottle on the ground.
   i) son  ii) his  iii) my

h) The girls standing under the tree are eating their lunch.
   i) girls  ii) tree  iii) their

i) When I looked over at him, I noticed that he was reading a book.
   i) I  ii) he  iii) him

j) The guys ate all of their pizzas.
   i) guys  ii) their  iii) pizzas

Q.2 Fill in with the correct articles – the and a/an.

a) The only sport we enjoy is _______ hockey.

b) I left it at _______ office.
c) He is _______ doctor.
d) He drives at a speed of 90 miles _______ hour.
e) It's in _______ Arthur Road.
f) I don't like _______ milk.
g) It's _______ third road on the left.
h) The River Yamuna is _______ longest river of all.
i) We're having fish for _______ dinner.
j) _______ price of petrol keeps rising.

Q.3 Each sentence is followed by two commonly confused homonyms. Choose the correct word to fill in the blank by clicking on the letter that precedes it.

a) Justin was _______ for the big exam when he discovered it had been cancelled.
   ii) all ready   ii) already

b) It was _______ seven o'clock by the time we reached Boston.
   i) all ready   ii) already

c) As a waitress, I was only allowed one fifteen-minute _______.
   i) Break   ii) brake

d) This pattern works best with _______, heavy fabric.
   i) Course   ii) Coarse

e) From my seat in the back of the auditorium, I could barely _______ the performance.
   i) Hear   ii) Here

f) The airplane began _______ descent.
   i) It's   ii) its

g) After an hour, he _______ Sharon wasn't coming.
   i) Knew   ii) New

h) There are _______ onions on this half of the pizza.
Q.4 Read the following passage and answers the questions that follow:

The doctors clamouring against reservations for OBCs have demanded that merit be the sole criteria for admission to medical and engineering colleges. Then, how is it that they haven’t objected either to the NRI quota or candidates who procure admission on the basis of capitation fee? Does this not affect quality? Reservation was introduced in the Kolhapur State as early as in 1902 and in the State of Mysore in 1921. In Tamil Nadu, where the human health index is much better than in other states, there is as much as 69 per cent reservation. Let us take for a moment that upper caste doctors are meritorious. But is this of any help to the nation when many of them use elite institutes as springboard to go abroad for higher wages. Nearly 70 percent of doctors from AIIMS doctors go abroad. How are these elite institutes, under such circumstances, serving the interests of the common people? On the other hand, it has been in Tamil Nadu that a good number of SC/ST/OBC doctors, who procured admission into colleges due to the reservation policy, stick to their state or hometown, resulting in better healthcare services.

1. Reservation is not a phenomenon exclusive to our country. The American MNC, IBM, voluntarily in traduced reservations for Blacks in 1930. In Malaysia there are reservations not just in jobs but also in contracts, licences and company shares for Malays. Reservation for the depressed and weaker sections exist in many countries like Brazil, South Africa, Japan, Netherland and Ireland. There is 50 per cent reservation for Blacks and women in the medical faculty of Harvard University. And the Whites have never made an issue of being eligible only for 50 per cent of the seats. In fact, it is the handful of anti- reservationist doctors, who talk of disintegration of society on account of reservation, who are really responsible for creating dissension and obstacles in the ways of social justice of the OBCs. The media have, of course, played a negative role. But it is a reality that Indian society is constituted on caste lines. If the anti-reservations are so concerned about the disintegration of society on caste lines, they should first lead the struggle against social discrimination.

2. Reservation gets a job or admission even if they get less percentage of marks, in one of the cases a person was in Indian Revenue Service. He saw that candidates
getting high marks in a competition were not necessarily successful in the field. Merit, as it is being presently understood, does not include honesty, hard work and patriotism. In the American school system, besides the syllabus, students have to undergo practical training in social

3. Services, etc. and marks are added in the certificate based on performance in thus area. The only people tailing of merit today are those who have studied in public schools or whose children study in such schools.

4. The expenditure incurred on education in public schools in 50 to 100 times more than those of corporation/government schools. There is a vast difference in quality between the teachers of public and government schools. Parents who can afford to send their children to public schools are mostly educated. They not only teach the children themselves at home but also provide coaching for them. On the other hand, parents who send their children to corporation/government schools are mostly uneducated. These children have to lend a helping hand to their parents after schools hours. Under such circumstances, what is wrong if such students ask for concession of a few marks?

5. Reservation will bring unity and integrated in society. Reservation in elite institutes will enable people from different social strata to come together and established bonhomie among them. It is true that reservation is not a permanent solution to the vexed problem of our society. As and when equal and compulsory education is introduced in the country, Dalits and OBCs will not stake their claims to reservation.

6. Reservation is not a pancea for the economic backwardness of the country. For this purpose, the government has already launched many schemes. Reservation is only a concession given to socially and educationally backward people, so that they may integrate with the mainstream. We have no objection if the poor among the upper caste people, too, are the benefit of reservations. But the problem here is that the among them start taking advantage of the policy.

On the basis of your reading the passage, answer the following questions:

a) Why were the Indian doctors clamouring(shouting loudly) against reservation? 2

b) Write down the procedure on the basis of capitation fee. 2

c) What ideas do you know about reservations in Malaysia and Harvard University? 2

d) What view is taken by the Indians and Americans about merit? 2

e) Point out the difference in Public as well as Government University. 1

f) What way out has been suggested in the passage about reservation? 2
g) On the basis of reading the passage, trace words that are similar in meaning to the following:
   i) The best possible (para-2) ii) Academically able (para-5)
   iii) A fine remedy (para-5) iv) Money spent (para-4)

Q.5 In each question below a sentence broken into five or six parts. Join these parts to make a meaningful sentence. The correct order of parts is the answer.

a) i) Left ii) The iii) House iv) He v) Suddenly

b) i) Do ii) Today iii) You iv) Must v) It

c) i) I ii) Immediately iii) Salary iv) My v) Want

d) i) Medicine ii) A iii) Neeta iv) Given v) Was

e) i) Bag? ii) You iii) Seen iv) Have v) My

Q.6 Fill in with the correct model:

a) Before this year, I __________ move out of my parents' house because I did not have a job.

b) Unfortunately, it's not so easy to find to find an apartment in the city. Without an agent, you _____ not be able to find all the available listings. (possibility)

c) Before now, I couldn't sign a lease, but now I _____ because I am twenty-one.

d) I asked my friends to help me move because I knew that I _____ fit all my possessions into my little car. (inability)

e) He added, " I _____ help earlier in the morning than later in the afternoon." (preference)

Q.7 Read each sentence to find out whether there is any grammatical error in it. The error, if any, will be in one part of the stench. The alphabet of that part is given at the end of each phrase as the answer. If there is no error, answer is (e)
a) As they planned a holiday (a)/ to Kashmir (b)/ they were happy that (c)/ it are a beautiful place(d) No error (e)
   i) a  ii) b  iii) c  iv) d  v) No error

b) By this time (1) / next year (2) / I had completed (3) / my post graduation. (4)
   i) 1  ii) 2  iii) 3  iv) 4  v) No correction required

c) The doctors would not (1) / allow anyone to (2) / enter into the (3) / patient's room. (4)
   i) 1  ii) 2  iii) 3  iv) 4  v) No correction required

d) He went (1) / to the shop (2) / to buy (3) / a scissor (4)
   i) 1  ii) 2  iii) 3  iv) 4  v) No correction required

e) She is my cousin sister (1) / who works as (2) / an Engineer (3)
   i) 1  ii) 2  iii) 3  iv) No correction required  2×5

End Semester Examination, May 2016

BCA -Third Semester

MATHEMATICS-II (BCA-301)

Time: 3 hrs

Max Marks: 75

No. of pages: 2
Note: Attempt **FIVE** questions in all; **taking at least ONE question** from each Unit. **Q.1 is compulsory.** All questions carry equal marks.

Q.1  a) Define square matrix with an example.
    
b) Construct a 3x3 matrix whose elements $a_{ij} = i - j$
    
c) The order of A matrix is mxp; the order of matrix B is pxn. Find the order of AB.
    
    \[
    A = \begin{bmatrix}
    5 & 3 & 2 \\
    0 & 4 & 1 \\
    0 & 0 & 3 
    \end{bmatrix}
    \]
    
d) If $A = \begin{bmatrix} 1 & 2 \\ 2 & 1 \end{bmatrix}$; find $|A|$
    
e) The set of all positive real numbers is not bounded above (True/False).
    
f) Find the value of \( \lim_{n \to \infty} \frac{2n + 3}{3n + 4} \).
    
g) Define subsequence with an example.
    
h) Find the value of \( \binom{20}{c_2} \).
    
i) Define alternating series with an example.
    
j) Define singular matrix with an example.

UNIT-I

Q.2  a) If $A = \begin{bmatrix} 1 & 2 \\ 2 & 1 \end{bmatrix}$, show that, $A^2 - 3I = 2A$.
    
    \[
    A = \begin{bmatrix} 1 & x & x^2 \\ 1 & y & y^3 \\ 1 & z & z^3 \end{bmatrix}
    \]
    
    \[
    \begin{bmatrix} 1 & x & x^2 \\ 1 & y & y^3 \\ 1 & z & z^3 \end{bmatrix}
    = (x - y)(y - z)(z - x)(x + y + z)
    \]
    
    b) Prove that
Q.3 a) If \( A = \begin{bmatrix} 3 & -1 & 2 \\ 4 & 0 & 5 \end{bmatrix} \) and \( B = \begin{bmatrix} -1 & 2 \\ 3 & -4 \\ -5 & 0 \end{bmatrix} \); verify that \( (AB)^T = B^T A^T \).

b) How many seven letter words can be formed from the letters of the word NUMBERS.

i) In how many of these N and S occur at the end?

UNIT-II

Q.4 a) Prove that union of 2 countable set is countable.

b) Prove that least upper bound of a set of it exist is unique.

UNIT-III

Q.5 a) Show that no real numbers other then zero is a limit point.

b) Prove that \( \mathbb{N} \times \mathbb{N} \) is countable; where \( \mathbb{N} \) is set of natural numbers.

UNIT-III

Q.6 a) By definition, show that the square \( \left\{ \frac{1}{n^2} \right\} \) is canvages to 0.

b) State and prove squeeze principle.

Q.7 a) State and prove comparison test of 5\(^\text{th}\) form.

b) Test for convergence the series:

\[
\frac{1}{1 \cdot 2 \cdot 3} + \frac{x}{4 \cdot 5 \cdot 6} + \frac{x^2}{7 \cdot 8 \cdot 9} + \ldots (x > 0)
\]
UNIT-IV

Q.8  a) Evaluate: \( \lim_{x \to x} x \tan \frac{1}{x} \) by L’ Hospital Rule.

b) If \( f(x) = x^3 + 2x^2 - 5x + 11 \), find the value of \( f\left(\frac{9}{10}\right) \) with the help of Taylor’s series.

Q.9  Show that \( x - \frac{x^2}{2} < \log(1 + x) < x - \frac{x^2}{2(1 + x)} \), \( x > 0 \).

End Semester Examination, May 2016

BCA -Third Semester

OBJECT ORIENTED DESIGN AND PROGRAMMING (BCA-302)

Time: 3 hrs  Max Marks: 75

No. of pages: 1
Note: Attempt **FIVE** questions in all; **taking at least ONE question** from each Unit. **Q.1 is compulsory.** All questions carry equal marks.

Q.1  

a) __________ is an example of procedural language.  
b) _______ and ________ are the data types available in C++.  
c) In for loop the statements execute ______ number of times.  
d) Static member data is ________ by all the objects of the class.  
e) An abstract class contains atleast ________.  
f) Virtual base class is used when ________.  
g) Inheritance enhances ________.  
h) In function overloading a class contains ________.  
i) A string is ________.  
j) An exception means __________.  

1½x10

**UNIT-I**

Q.2 Differentiate between procedural language and object oriented language.  

Q.3 Explain the features of object oriented programming in detail.  

**UNIT-II**

Q.4 Write short notes on the following:
   a) Formatting output using manipulators.  
   b) Passing parameters to a function by value.  
   c) Objects in C++.  

5x3

Q.5 Explain all the data types available in C++.  

15
UNIT-III

Q.6 What is a constructor? Explain its need and execution with the help of an example.

15

Q.7 Write short notes on the following:
   a) Pure virtual function.
   b) Function overloading.
   c) Polymorphism.

5x3

UNIT-IV

Q.8 Explain the order of execution of constructors and destructors in inheritance.

15

Q.9 What is exception handling? What is its need? Explain with the help of an example.

15

End Semester Examination, May 2016

BCA - Third Semester

DATABASE SYSTEM (BCA-303)

Time: 3 hrs

Max Marks: 75

No. of pages: 2
Note: Attempt FIVE questions in all; taking at least ONE question from each Unit. Q.1 is compulsory. All questions carry equal marks.

Q.1 Multiple choice questions:

a) The language used for writing query is:
   i) SQL ii) DBTG iii) System R iv) None of the above.

b) Data dictionary is used for:
   i) Accessing database about databases.
   ii) The contents of files.
   iii) Access details.
   iv) None of the above.

c) DDL is a language that allows:
   i) To delete rows ii) To define data and their relationships
   iii) To grant privileges iv) To add new rows

d) Which company has developed hierarchical model?
   i) IBM ii) Sun Microsystems
   iii) Microsoft iv) Oracle

e) An attribute that can be broken down into smaller parts is called a(n) ______ attribute:
   i) Associative ii) Simple
   iii) Composite iv) Complex

f) Which of the following is an entity type on which a strong entity depends?
   i) Owner ii) Member
   iii) Attribute iv) None of these
g) SQL statements are divided into following categories:
   i) DDL & DMI
   ii) DCL
   iii) TCL
   iv) All of the above

h) Lower function converts:
   i) Character for the decimal equivalent.
   ii) Strips trailing character.
   iii) Converts string to lower case.
   iv) Convert string to upper case.

i) UNF refers to:
   i) Foreign key
   ii) Primary key
   iii) Multi valued dependencies
   iv) Atomicity

j) The concurrent execution of transactions are based on:
   i) Locking data items
   ii) Insertion
   iii) Deletion
   iv) Updation

UNIT-I

Q.2  a) Discuss the responsibilities of DBA.  

b) Explain three-level architecture. Discuss its objectives and the role of mapping.

Q.3  What is the role of E-R model, explain its various components and develop an E-R model for library managements system.

UNIT-II

Q.4  What are the different types of relational operators? Explain traditional and special operators in detail.
Q.5 Explain the following functions in SQL with their syntax and command:
   a) MOD  b) POWER  c) ABS  d) LPAD  e) INITCAP

UNIT-III

Q.6 a) Explain the Armstrong rules of functional dependency in brief.

b) What is meant by normalization? Why we normalize a database, what are the different types of anomalies exist in a database? Discuss.

UNIT-IV

Q.7 What is meant by projection join normal form? Explain the importance of 5th NF with an example.

Q.8 What is a deadlock? Explain deadlock detection and its prevention techniques in detail.

Q.9 Compare deferred and immediate database modification recovery techniques and also explain their process with undo and redo operations.
End Semester Examination, May 2016

BCA -Third Semester

BUSINESS ORGANISATION AND PRINCIPLES OF MANAGEMENT

(BCA-304)

Time: 3 hrs

Max Marks: 75

No. of pages: 1

Note: Attempt FIVE questions in all; taking at least ONE question from each Unit. Q.1 is compulsory. All questions carry equal marks.
Q.1  
a) What is the impact of programmed decision on organizations?

b) ________ is a situation in which a manager can make accurate decisions because the outcome of every alternative is known.

c) Define non programmed decision.

d) If an individual knows the price of three similar cars at different leaderships, he/she is operating under what type of decision making condition.

   i) Risk  
   ii) Uncertainty  
   iii) Factual  
   iv) Certainty

e) Organizational efficiency is improved by the use of ________.

f) Taking decision for future which is based on the past happening is known as ________.

g) Egotistical is not a decision making style. (TRUE/FALSE)

h) Define “maximizing the minimum possible payoff”.

i) There are ________ types of degree of delegation.

j) One of the external environment factor that influence management is ________.

UNIT-I

Q.2  
a) Is profit maximization the only objective of business? Discuss.  

b) Define business process outsourcing. What are its advantages?

Q.3  
Discuss the role of entrepreneur in business promotion. Outline the basic characteristics of an entrepreneur.

UNIT-II

Q.4  
What consideration should be kept in mind in the choice of a suitable form of business organization? Explain.
Q.5 Write short notes on:
   a) Decentralization.
   b) Channels of distribution.
   c) Stress management.  5x3

UNIT-III
Q.6  a) Describe briefly the selection process.  7
   b) Explain Maslow need hierarchy theory.  8

Q.7 What do you mean by controlling? What is its suitability in a business organization?  15

UNIT-IV
Q.8 Discuss the ethics and concept of performance management and explain MBO method of performance appraisal.  15

Q.9 Discuss the concept of collective bargaining and explain its importance industrial relations.  15
End Semester Examination, May 2016

BCA – Third Semester

BUSINESS COMMUNICATIONS AND CONVERSATIONAL SKILLS-I (BCA-306)

Time: 3 hrs

Max Marks: 75

No. of pages: 2

Note: Attempt all questions are compulsory:

Q.1 Answer any five of the following questions:
a) What is the rate of speech?
b) What is Subject-Verb Agreement?
c) What is slang language? Give an example.
d) What is Indianism?
e) What are Adjectives? Give examples.
f) What is colloquialism?

2x5

Q.2 Fill in the blanks with the most appropriate conjunctions:

a) Receptionists must be able to relay information _______ pass messages accurately.
   i) or   ii) and   iii) but   iv) because

b) I did not go to the show _________ I had already seen it.
   i) until   ii) because   iii) so   iv) but

c) Mary is a member of the historical society _________ the literary society.
   i) as   ii) or   iii) and   iv) but

d) Read over your answers _________ correct all mistakes before you pass them up.
   i) or   ii) and   iii) because   iv) while

e) Keep the food covered _________ the fillies will contaminate it.
   i) or   ii) and   iii) until   iv) though

f) _________ he is thin, he is strong.
   i) But   ii) As   iii) Though   iv) Because

g) Susie _________ phoned _________ wrote after she left home.
i) either, or
ii) neither, nor
iii) while, and
iv) though, or

h) She had an unpleasant experience _____ she was in Thailand.
   i) but
   ii) and
   iii) because
   iv) while

i) The committee rejected the proposal ______ they did not think it was practical.
   i) or
   ii) but
   iii) though
   iv) because

j) John welcomed his guests ______ offered them drinks.
   i) and
   ii) while
   iii) until
   iv) as

k) You treated him badly ______ he is doing the same to you now.
   a) so
   ii) if
   iii) but
   iv) although

l) He is sick ______ he wants to go out.
   i) when
   ii) yet
   iii) that
   iv) because

m) _______ there is no more butter you must use the margarine.
   i) So
   ii) Either
   iii) Since
   iv) But

n) Gerard, _______ Pete, is joining us on the trip.
   i) as well as
   ii) nor
   iii) whereas
   iv) if

o) She was afraid ______ the building would collapse.
   i) and
   ii) while
   iii) even
   iv) that

Q.3 Choose the correct form of the verb that agrees with the subject.
a) Annie and her brothers (is, are) at school.
b) Either my mother or my father (is, are) coming to the meeting.
c) The dog or the cats (is, are) outside.
d) Either my shoes or your coat (is, are) always on the floor.
e) George and Tamara (doesn't, don't) want to see that movie.
f) Benito (doesn't, don't) know the answer.
g) One of my sisters (is, are) going on a trip to France.
h) The man with all the birds (live, lives) on my street.
i) The movie, including all the previews, (take, takes) about two hours to watch.
j) The players, as well as the captain, (want, wants) to win.
k) Either answer (is, are) acceptable.
l) Every one of those books (is, are) fiction.
m) Nobody (know, knows) the trouble I've seen.

Q.4 Simple Present Continuous Tense: Change the verb into the correct form:

a) Anna (rest) right now.
b) I (talk) on the phone at this moment.
c) Bella (cook) dinner now.
d) They (help) the teacher right now.
e) He (run) very fast!
f) Julia (bake) a chocolate cake at the moment.
g) I (have) fun!
h) You (dance) very nicely.
i) They (answer) all the questions.
j) John (eat) Salad, and I am eating fish.
k) Marta (drive), and Chris is sleeping (sleep).
l) It (rain).
m) I (write) my homework.
n) We (work) on the new show right now.

o) Kate (lie) in bed now.

Q.5 Identify the Indianism in the following statements and write the correct statement:

a) She is more taller than john.
b) He retuned it back to me.
c) I will revert it back to you.
d) This is more preferable.
e) When I was small?
f) I am having long hair.
g) Meet at 6am in the morning.
h) I didn't knew that.
i) I am very much pleased to see you.
j) The water is good for drinking.

Q.6 Write short notes on (any two):

a) My objective in life.
b) Role of ethics in life.
c) Job vs Business.
End Semester Examination, May 2016

BCA -Fourth Semester

E-COMMERCE (BCA-401)

Time: 3 hrs

Max Marks: 75

No. of pages: 2

Note: Attempt FIVE questions in all; taking at least ONE question from each Unit. Q.1 is compulsory. All questions carry equal marks.

Q.1 a) Which of the following will not harm computer resources?

i) Firewall

ii) Virus

iii) Trojan horse

iv) None of the above
b) Which is not a function of ERP?
   i) Warehousing
   ii) Sales
   iii) Scheduling
   iv) All of the above

c) Which type of e-commerce focuses on consumers dealing with each other?
   i) B2B
   ii) B2C
   iii) C2B
   iv) C2C

d) Which type of e-commerce deals with auction?
   i) B2B
   ii) B2C
   iii) C2B
   iv) C2C

e) The solutions for all business needs is:
   i) EDI
   ii) ERP
   iii) SCM
   iv) None of the above

f) Give at least three examples of the website which provide e-cash facility.

g) Name any two commercial internet payment systems.

h) What is C2C?

i) Name any three internet protocols.

j) Domain name is the name by which _______ is identified.

\[1\frac{1}{2} \times 10\]

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**UNIT-I**

Q.2 Define e-commerce. Discuss various advantages and disadvantages of e-commerce. In what way is security a limitation of e-commerce?  
**15**

Q.3 Describe a competitive strategy. Explain the Porter’s model of competitive strategy.  
**15**

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**UNIT-II**
Q.4  a) Explain Porter’s value chain model.  

5 

b) What are the advantages of using e-commerce?  

10 

Q.5  a) Explain first mover advantage. Illustrate with an example.  

5 

b) How business environment and business strategy helps in improving the business.  

10 

UNIT-III 

Q.6  Explain the requirement for internet-based payments in brief. Also explain the unique features and uses of smart cards.  

15 

Q.7  Explain the security schemes in electronic payment system. Elaborate on some of the ethical issues surrounding the internet.  

10 

UNIT-IV 

Q.8  a) Explain various hardware and software requirements for connectivity of a computer with internet.  

10 

b) Distinguish between ‘routers’ and ‘hubs’.  

5 

Q.9  Explain the following:  

a) Digital economy.  

b) Virtual communities.  

c) Global e-commerce.  

5x3
End Semester Examination, May 2016

BCA – Fourth Semester

OPERATING SYSTEM (BCA-402)

Time: 3 hrs  Max Marks: 75
No. of pages: 1

Note: Attempt FIVE questions in all; taking at least ONE question from each UNIT. Q.1 is compulsory. All questions carry equal marks.

Q.1 Fill in the blanks with appropriate word:

a) __________ is useful when application do not require user interaction.

b) A computer cannot boot if it does not have __________.

c) The inner most layer close to hardware is called __________.

d) __________ operating system support single user process and single thread.
e) Details of a process are stored in a data structure called __________.
f) Long term scheduler is also called as __________.
g) __________ condition must hold for non-sharable resources.
h) __________ is used to organize files.
i) Time required to move the read/write head to the designated track is called __________ time.
j) A directed edge from a resource $R$ to process $P$ is called __________ edge. 1½×10

UNIT-I

Q.2 Define an operating system and give its functions in detail. 15

Q.3. What is the main advantage of the layered approach to operating system? 15

UNIT-II

Q.4 In a multi-process system, at any moment a process may be in either of three states: running, ready or blocked. What are the reasons of transitions between these states and when do these occur? Also explain the Process Control Block (PCB). 15

Q.5 Explain CPU scheduling algorithms with a suitable example. 15

UNIT-III

Q.6 What do you mean by page fault? Explain the concept of page fault with the help of a relevant example. 15

Q.7 Write short notes on:
   a) Swapping.
   b) Sequential and concurrent process. 7½×2

UNIT-IV

Q.8 List advantages and disadvantages of contiguous and linked allocation methods. 15
Q.9 Explain disk scheduling algorithm by taking suitable examples.

End Semester Examination, May 2016
BCA – Fourth Semester
WEB DESIGNING AND INTERNET APPLICATION (BCA-403)

Time: 3 hrs Max Marks: 75
No. of pages: 2

Note: Attempt FIVE questions in all; taking at least ONE question from each UNIT. Q.1 is compulsory. All questions carry equal marks.

Q.1 a) JavaScript is _________ side scripting language.
   i) Server 
   ii) Browses 
   iii) ISP 
   iv) None of the above 

b) Each computer connected to internet must:
   i) be an IBC PC 
   ii) have a unique IP address 
   iii) be internet compatible 
   iv) None of the above 

c) Which of the following HTML code in valid?
d) HTML language is a set of markup __________.
   i) Attributes
   ii) Tags
   iii) Sets
   iv) Groups

e) Pick the odd one out.
   i) Table
   ii) TR
   iii) TD
   iv) Form

f) __________ is suitable for remote administration of a computer.
   i) FTP
   ii) Shell
   iii) Remote procedure call
   iv) Telnet

g) Which of the following protocol is used for e-mail services?
   i) SMAP
   ii) SMTP
   iii) SMIP
   iv) SMOP

h) Which of the following HTML Tag of Line break?
   i) <p/>
   ii) <lb>
   iii) <br/>
   iv) <break/>

i) FTP is an acronym for __________.

j) CSS is an acronym for __________.  

UNIT-I

Q.2 a) What are the factors required for designing a website for the client?  

b) Write short notes on:
   i) Telnet
   ii) Gopher

Q.3 a) Discuss the client-server architecture using block diagram.
b) Define WWW. What are browsers? How internet addressing is done?  

UNIT-II

Q.4 a) What is HTML? Explain HTML standards. Explain the significance of HTML tags.  

b) Explain the image tag with its attributes.

Q.5 Design registration form that shows personal details, area of interest, year of passing, marks, experience, projects done, etc. using table tag.

UNIT-III

Q.6 Explain Frames and its applications. Explain the <Frame set> tag with its attributes.

Q.7 What is form? How does a form work? Discuss some of the form elements. Explain <input> tag.

UNIT-IV

Q.8 Create the following table using various important attributes:

<table>
<thead>
<tr>
<th>Airline Reservation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flight No.</td>
</tr>
<tr>
<td>------------</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

Write at least 5 records

Q.9 a) What is CSS? Differentiate between internal, external and inline style-sheets.

b) Write a program in JavaScript for addition of the numbers.
Q.1 a) The process by which the receiver confirms the message and comprehends the intent of the sender is called __________.

b) Movements while making a presentation shows energy.  (True/False)

c) Planning in advance is an absolute must for a successful discussion.  (True/False)

d) To be able to give a good presentation, a full rehearsal is:

   i) Optional
   ii) Useless
   iii) Audience based
   iv) Necessary
e) Leadership is the ability to:
   i) Influence others.
   ii) Motivate others.
   iii) Enable others to contribute towards the effectiveness and success of an organization.
   iv) All of the above.

f) First step of preparing oral presentation is to determine the:
   i) Audience
   ii) Purpose
   iii) Message
   iv) Topic

g) Which of the following is a function served by attitudes?
   i) Knowledge function.
   ii) Value-expressive function.
   iii) Ego-defensive function.
   iv) All of the above.

h) The job satisfaction of an employee is dependent on the:
   i) Behaviour
   ii) Attitude
   iii) Personality
   iv) Employer

i) Written communication is _________.

j) To make a presentation effective and impressive, you should use:
   i) Complex sentences.
   ii) Jargon
   iii) Passive sentences.
   iv) Simple and active form of sentences.  

UNIT-I

Q.2 How does communication help you at work and outside work? What are the benefits associated with effective communication?  

Q.3 How can emotional intelligence be used as a problem solving tool?  

UNIT-II
Q.4 What is meant by an attitude? How attitude works for an individual?

Q.5 Solve the following:
   a) X loaned Y `5,000/- at a yearly interest rate of 5%. After one year how much money will be received by X?
   b) Half percent, written as decimal is __________.
   c) The population of a town increases every year by 4%. If its present population is 50,000 then after 2 years it will be __________.
   d) The cost of an article is `75/-. The cost was increased by 20% and later on it was reduced by 20%. What is the present cost of the article?
   e) Each side of a rectangular field is diminished by 40%. By how much percent is the area of the field diminished.

UNIT-III

Q.6 Write short notes on:
   a) Brainstorming.
   b) Logical sequence pole in a presentation.
   c) Presentation formats.

UNIT-IV

Q.7 Making presentations is a skill which can be intrinsic to an individual or can be developed. Explain.

Q.8 a) Write a detailed note on the role of personal appearance in interviews.
   b) Why is it necessary to make an interviewer do most of the talking?

Q.9 Performance appraisal interview should be handled with full preparation and ground work. Elaborate.
Q.1 Fill in the blanks:

a) Web 2.0 is ________.
b) POS stands for ________
c) HTTP is ________
d) WWW stands for ________
e) Tuck shops are used for ________.

2x5

Answer the following:
f) What is phishing?

g) What is URL?

h) Define EFTPOS.

i) Define computer virus.

j) What is digital signature?  

1x5

UNIT-I

Q.2 Explain teleworking with their advantages. What is electronic data interchange and digital signature? Why it is used for the purpose of security?  

15

Q.3 a) Differentiate between Bluetooth and Wi-Fi technology.

b) Write a short note on E-filling and HTTP.  

7½x2

UNIT-II

Q.4 How do we maintain blog? What are the steps to create a blog and make it available for public to capture the opinion? Also explain the ‘spam’ in brief.  

15

Q.5 What are viruses and anti-viruses? Discuss their advantages and disadvantages. Also explain their types with examples.  

15

UNIT-III

Q.6 What do you mean by cyber audit and explain why cyber audit is required? Give four items of data that may be recovered by cyber audit software.  

15

Q.7 What do you understand by cyber crime? Explain ethical issues related to the use of internet. Define information security policy.  

15

UNIT-IV
Q.8  
   a) Discuss the health problems related to ICT.

   b) What are modeling application? Explain the role of TUCK SHOP finance.

Q.9  
Discuss the ICT applications in retail industry, manufacturing industry and booking system.

End Semester Examination, May 2016

BCA – Fifth Semester

SOFTWARE ENGINEERING (BCA-502)

Time: 3 hrs

Max Marks: 75

No. of pages: 2

Note: Attempt FIVE questions in all; taking at least ONE question from each Unit. Q.1 is compulsory. All questions carry equal marks.

Q.1  Multiple choice questions:

   a) Effective testing will reduce ________ cost:

      i) Maintenance
      ii) Documentation
      iii) Design
      iv) Coding

   b) Who writes the SRS document?

      i) Developer
      ii) Tester
      iii) Analyst
      iv) None of above
c) Structured programming codes include:
   i) Sequencing
   ii) Alteration
   iii) Iteration
   iv) All of the above

d) RAD model has:
   i) 2-phases
   ii) 3-phases
   iii) 5-phases
   iv) 6-phases

e) Which model can be selected if user is involved in all phases of SDLC?
   i) Waterfall
   ii) Prototype
   iii) RAD
   iv) All of the above

Fill in the blanks:

f) The sudden and complete failure of a computer system is called _______.

h) Alpha testing will be done by _______.

i) Validation is _______ based approach.

j) Variance from product specification is called _______.

UNIT-I

Q.2 Differentiate between spiral model and waterfall model. Which one is better and why? 15

Q.3 a) Write a short note on ‘software crisis’. 5
b) What are various phases of SDLC?

UNIT-II

Q.4 a) What is software requirement specification? What is the structure of SRC? Explain with the help of an example.

b) What is LOC? Explain the advantages and disadvantages of this metric.

Q.5 a) What are various factors involved in software project scheduling?

b) Explain function point metric in detail.

UNIT-III

Q.6 a) What are various principles of software design?

b) What are various methods to prepare the design of software?

Q.7 Explain COCOMO model in detail.

UNIT-IV

Q.8 a) Explain the following:

i) Error ii) Bug iii) Fault iv) Defect v) Failure 5x2

b) Explain mutation testing with an example.

Q.9 a) Explain equivalence class partitioning with the help of an example.
b) What is the difference between stress testing and load testing?

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**End Semester Examination, May 2016**

**BCA -Fifth Semester**

**COMPUTER GRAPHICS (BCA-503)**

Time: 3 hrs

Max Marks: 75

No. of pages: 2

Note: Attempt **FIVE** questions in all; **taking at least ONE question** from each Unit. **Q.1 is compulsory.** All questions carry equal marks.

Q.1 a) The distance of a line from the projection planes determines:

i) Its size on projection plane

ii) Its length on projection plane

iii) Its width on projection plane

iv) Its height on projection plane

b) The centre of projection for parallel projectors is at:

i) Zero

ii) Infinity

iii) One

iv) None of these

c) A three dimensional graphics has:
i) Two axes
   ii) 3 axes

iii) Four axes
    iv) None of these

d) A line can be represented by:
   i) 2 points
      ii) 3 points

   iii) 4 points
      iv) 1 point

e) Two consecutive rotation transformations are:
   i) Additive
      ii) Subtractive

   iii) Multiplicative
    iv) None of these

f) The process of mapping a world window in world coordinate system to viewport is called:
   i) Transformation viewing
   ii) View port

   iii) Clipping window
    iv) Screen coordinate system

g) Types of keyboard are:
   i) Standard
      ii) Gaming and multimedia

   iii) Thumbsized
    iv) All of these

h) Joysticks are often used to control:
   i) Typing
      ii) Video games

   iii) Voice
    iv) None of these

i) The flat panel display is ________ in appearance:
i) Flat
  ii) Curved

iii) Both (i) and (ii)
iv) None of these

j) __________ ink is used in laser printer:

i) Wet
  ii) Dry

iii) Both (i) and (ii)
iv) None of these

UNIT-I

Q.2 a) How is graphic useful in daily life? Explain through some examples.

b) What do you mean by standard? Explain graphics standard in detail.

Q.3 a) What are the primary components of a CRT? What are the requirements to refresh it?

b) Write a short note on ‘hard copy devices’.

UNIT-II

Q.4 a) What do you mean by transformation. Find the matrix that represents rotation of an object by \(30^\circ\) from its origin.

b) What do you mean by a scan conversion? What are the major adverse effects of a scan conversion?
Q.5 What do you understand by ‘clipping’? Explain Cohen Sutherland algorithm for a line clipping.

UNIT-III

Q.6 A unit cube is translated by 3 units along x-axis, 2 units along y-axis and 5 units along z-axis. What would be coordinates for a new transformed object?

Q.7 Explain following terms:
   a) Vanishing points
   b) Forshortening factor
   c) View plan
   d) Center of projection
   e) 3-dimensional rotation

UNIT-IV

Q.8 Write a program in C language to implement Bresenhem’s line drawing algorithm.

Q.9 Explain the following:
   a) Floodfill function
   b) Use of ‘DETECT’ keyword.
   c) Parameter in printgraph()
   d) Significance of closegraph()
   e) Differentiate between clrscr() and cleardevice()
Q.1 a) The number of significant digits in the number 204.020050 is ___________.

b) Mean value of binomial distribution is ______________.

c) What is random sampling?

d) The two initial values of the roots of equation $x^3 - x - 3$ are ____________.

e) Define rounding-off-error and truncation-error with an example.

f) Draw the Newton’s forward difference table:

<table>
<thead>
<tr>
<th>$x$</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>$y'$</td>
<td>1</td>
<td>3</td>
<td>9</td>
<td>31</td>
<td>81</td>
</tr>
</tbody>
</table>
g) If $x = 0.00458529$. Find the absolute error if $x$ is truncated to 3 decimal digits.

h) Which of the following methods has linear rate of convergence?
   i) Regula-falsi  ii) Bisection  iii) Newton Raphson
   iv) None of the above

i) The line obtained by the method of least square is known as the line of:
   i) Straight line   b) Second degree equation  c) Best fit

j) Iteration method is a ________ method:
   i) Direct  b) Indirect  c) Self correcting  d) Step by step 1½x10

UNIT-I

Q.2 a) The solution of the problem is 3.436. It is known that the absolute error in the solution is less than 0.01. Find the interval with in which the exact value must lie. 5

b) Explain bisection method. Find a root of equation $X^3 - X - 1 = 0$, using bisection method. 10

Q.3 a) Using Euler’s method, find an approximate value of $y$ corresponding to $X = 1$, given that $\frac{dy}{dx} = x + y$ and $y = 1$, when $x = 0$. 9

b) Apply R.K method of 4th order to find an approximate value of $y$ when $x = 0.2$ given that $\frac{dy}{dx} = x + y$ and $y = 1$, when $x = 0$. 6

UNIT-II

Q.4 a) Find a cubic polynomial which takes the following values:

<table>
<thead>
<tr>
<th>$x$</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
</table>
Hence or otherwise evaluate \( f(4) \).

(b) If \( y(1) = -3 \); \( y(3) = 9 \); \( y(4) = 30 \); \( y(6) = 132 \), find the Lagrange's interpolation polynomial that takes the same values as \( y \) at a given point.

Q.5 Derive Newton’s forward interpolation formula. Estimate the value of \( f(22) \) and \( f(42) \) from the following data:

<table>
<thead>
<tr>
<th>( x )</th>
<th>20</th>
<th>25</th>
<th>30</th>
<th>35</th>
<th>40</th>
<th>45</th>
</tr>
</thead>
<tbody>
<tr>
<td>( f(x) )</td>
<td>354</td>
<td>332</td>
<td>291</td>
<td>260</td>
<td>231</td>
<td>204</td>
</tr>
</tbody>
</table>

UNIT-III

Q.6  
(a) Fit a parabola of the form \( y = a + bx + cx^2 \) to the data:

<table>
<thead>
<tr>
<th>( x )</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>( y )</td>
<td>1.7</td>
<td>1.8</td>
<td>2.3</td>
<td>3.2</td>
</tr>
</tbody>
</table>

By method of least square.

(b) Evaluate \( \int_{a}^{b} \frac{dx}{1 + x^2} \) by using:  
   i) Trapezoidal rule  
   ii) Simpson’s \( \frac{1}{3} \) \( rd \) rule

Also compare the result with its actual value.
Q.7  
\hspace{1cm} \text{a) Explain the method of least square. Describe the method of least square to fit a straight line. Use this method to fit the straight line } y = a + bx \text{ to the data:}

\begin{center}
\begin{tabular}{|c|c|c|c|c|}
\hline
\text{x} & 1 & 2 & 3 & 4 \\
\hline
\text{y} & 0.17 & 0.18 & 0.23 & 0.32 \\
\hline
\end{tabular}
\end{center}

\hspace{1cm} \text{b) Evaluate } \int_0^4 e^{-x} \text{ by Simpson’s rule and compare it with actual value.}

\hspace{2cm} \text{UNIT-IV}

Q.8  
\hspace{1cm} \text{a) A workshop produces 2000 units per day. The average weight of units is 130 kg with a standard deviation of 10 kg. Assuming normal distribution, how many units are expected to weigh less than 142 kg [Area under } Z = 1.2 \text{ is } 0.3849].

\hspace{1cm} \text{b) On an average, one in 400 item is defective. If the item are packed in boxes of 100, what is the probability that any given box of item will contain:}

\hspace{2cm} \text{i) No defective \hspace{1cm} \text{ii) Less than 2 defective}

Q.9  
\hspace{1cm} \text{a) A manufacturer who produces medicine bottles, finds that 0.1\% of the bottles are defective. The bottles are packed in boxes containing 500 bottles. A drug manufacturer buys 100 boxes from the producer of bottles. Using Poisson’s distribution, find how many boxes will contain:}

\hspace{2cm} \text{i) No defective \hspace{1cm} \text{ii) At least 2 defectives}

\hspace{1cm} \text{b) What is sampling? Describe various sampling methods with examples.
Q.1 Read each sentence and determine the meaning of the word (in capital letters) in the given context. Also write at-least three synonyms of each word.

a) Ena, It is LAMENTABLE that you and Derrick reported, but it has almost been an year. Don’t you think it’s time to move on in your life?

b) To prepare the cafeteria for the big dance, the planning committee ADORNED the walls with colourful papers and balloons.
c) The flood caused tonic molds to grow on the walls of our old house and now it is UNINHABITABLE.

d) Brain attempted to see who was riding inside the limousine, but the OPAQUE window prevented his from getting even the slightest glimpse.

e) Owing to his PARSIMONIOUS nature, Jack never spent a single penny in his college canteen.

2x5

Q.2 Fill in the blanks by with correct form of the verb (given in bracket).

a) The headmaster _________ to speak to you. (want)

b) I ______ a new bicycle last week. (buy)

c) It _________ since morning. (rain)

d) I __________ a lot of work today. (do)

e) I __________ something burning. (smell)

f) Did you think you _________ me some where before? (see)

g) The town ________ its appearance completely since 1980. (change)

h) Sheila ________ her case, look. (pack)

i) When I was in Sri Lanka, I __________ Colombo. (visit)

j) The result ________ yesterday. (declare)

Q.3 The word 'big' is often used in collocations with happening or event. Supply at least five english collocations with the word 'BIG'.

Q.4 Supply some suitable adverbs to collect with the following words to strengthen their meaning:

a) Clean.

b) Rude.

c) Ashamed.
Q.5 What is a group discussion? How is it different from the debate?

Q.6 Give at least five examples of disyllabic words.

Q.7 What is “empathy”? Explain in 150 words how empathy is related to success in one’s career.

Q.8 Write down the antonym of these words:
   a) Sorrow.
   b) Simple.
   c) Expand.
   d) Unlovable.
   e) Sad.

Q.9 Write down the meaning of these phrasal verbs and create a journal of a weekly business meeting. The phrasal words must fit in contextually.
   a) Out cry.
   b) Stick together.
   c) Spoke out.
   d) Give in.
   e) Fell out.
End Semester Examination, May 2016

BCA – Sixth Semester

SQL, PL/SQL AND D2K (BCA-601(B))

Time: 3 hrs
Max Marks: 75

No. of pages: 1

Note: Attempt FIVE questions in all; taking at least ONE question from each Unit. Q.1 is compulsory. All questions carry equal marks.

Q.1 Fill in the blanks:

a) PL/SQL stands for ________.

b) Hierarchical model uses ________ relationship.

c) In network model ________, ________ and ________ relationships can be represented.

d) ________ is an example of RDBMS.
e) Two types of functions available in SQL are _______ and ________.
f) Index is used to ________.
g) PL/SQL block has ________ sections.
h) ________ and __________ are data types available in PL/SQL.
i) ________ command is used in D2K to create a save button.
j) How can the records be deleted from a D2K form? Write the command.

1½x10

UNIT-I

Q.2  a) Explain the three layer architecture of database management system. 7½
     b) Explain the hierarchical data model with the help of an example. 7½

Q.3  a) Explain the advantages of using PL/SQL with the help of an example. 7½
     b) Explain the second and third normal form (2NF and 3NF) in a database design with the help of examples. 7½

UNIT-II

Q.4  a) Explain all the data types available in SQL. 5
     b) What is a cluster? Explain the need of cluster with the help of an example. 10

Q.5  a) Explain five SQL commands with the help of examples. 5
     b) Differentiate between the inner-join and outer-join with the help of examples. 10

UNIT-III
Q.6 Explain the control structures available in PL/SQL with the help of suitable examples.  

Q.7 Differentiate between the following:
   a) Procedure and Function.
   b) SQL and PL/SQL.  

UNIT-IV

Q.8 Explain the features of Developer 2000 (D2K) in detail.  

Q.9 Explain the steps of creating a menu in D2K.
End Semester Examination, May 2016

BCA – Sixth Semester

JAVA PROGRAMMING (BCA-601A)

Time: 3 hrs

Max Marks: 75

No. of pages: 1

Note: Attempt FIVE questions in all; taking at least ONE question from each Unit. Q.1 is compulsory. All questions carry equal marks.

Q.1 a) Which is a reserve word in the Java programming language?
   i) Method  ii) Native  iii) Subclasses  iv) Reference

   b) What is the purpose of finalization?

   c) What is static block?

   d) What is final variable?

   e) What is garbage collection?
f) What is native method?

g) What is nested class?

h) A package is a collection of

i) Classes
ii) Interface
iii) Editing tools
iv) Classes and interfaces

State whether TRUE or FALSE:

i) A constructor can be made final.

j) A final class may not have any abstract method.

1½x10

UNIT-I

Q.2 a) What is JVM? Explain the architecture of JVM.

6

b) Describe the structure of typical Java program.

6

c) Why Java is called free-form language?

3

Q.3 a) What is World Wide Web? What is the contribution of Java to the World Wide Web?

8

b) Explain all features of Java in detail.

7

UNIT-II

Q.4 a) What is array? How do we declare array in Java without size?

8

b) What is the difference between break statement and continue statement in Java?

7

Q.5 a) Explain all the operators supported by Java.

8
b) Write a program in Java to find the duplicate element in an array.

UNIT-III

Q.6  
  a) What is finally block? Can finally block be used without catch? Explain with program.

  b) What is constructor? Explain the purpose of default constructor.

Q.7  
  a) What is the difference between final, finally, finalize() in Java?

  b) What do you mean by polymorphism? Explain.

UNIT-IV

Q.8  
  a) What is method overriding? Can we override static method and overloaded method? Justify your answer with suitable program.

  b) Explain the difference between abstract class and interface.

Q.9  
  a) What do you mean by inheritance? Explain.

  b) What is the applet life cycle? Explain the various methods available in applet class.
End Semester Examination, May 2016

BCA -Sixth Semester

DATA COMMUNICATION AND NETWORKING (BCA-602)

Time: 3 hrs

Max Marks: 75

No. of pages: 1

Note: Attempt FIVE questions in all; taking at least ONE question from each Unit. Q.1 is compulsory. All questions carry equal marks.

Q.1 Fill in the blanks:

a) Encryption and decryption are the functions on the ______ layer.

b) To create a _______, combine crossbar switches in stages.

c) _______ are the highest frequency electromagnetic waves in use for data communication.

d) The data unit from the transport layer that uses UDP is called a ________.  

e) CSMA/CD stands for ________.

Answer the following in two lines:
f) How are OSI and ISO related to each other?
g) Name the factors that affects the performance of a network.
h) What is the difference between even parity and odd parity?
i) What is the function of a router?
j) For private key encryption discuss the keys and their ownership.

UNIT-I

Q.2 What is the relationship between telecommunications and data communication? Identify the fine components of data communication and explain with a suitable diagram.

UNIT-II

Q.4 Write the short notes on following:
   a) SMTP
   b) Telnet
   c) DNS

Q.5 Construct the Hamming code for bit sequence 10011101. Use hamming code algorithm to correct the code if bit at position 9 is in error.

UNIT-III

Q.6 Distinguish between a peer-to-peer relationship and a primary-secondary relation. Categorize and explain five basic topologies in terms of line configuration.
Q.7 In routing, what does the term “shortest” mean? Explain distance vector routing algorithm with an example.

UNIT-IV

Q.8 What are the three switching methods? Discuss the two popular approaches of packet switching with a proper diagram.

Q.9 Explain the following:
   a) Cryptography.
   b) Firewalls.
   c) Token ring.
End Semester Examination, May 2016

BCA – Sixth Semester

MULTIMEDIA AND ANIMATION (BCA-603)

Time: 3 hrs

Max Marks: 75

No. of pages: 2

Note: Attempt FIVE questions in all; taking at least ONE question from each Unit. Q.1 is compulsory. All questions carry equal marks.

Q.1 Multiple choice questions:

a) The s/w vehicle, the messages, and the content presented on a computer or television screen together make up:

i) Multimedia project  ii) CD-ROM

iii) A CD-ROM  iv) An authoring tool

b) Which hardware platform is considered by many multimedia developers to be better equipped to manage both sound and video editing?

i) Dell  ii) Sun
iii) Apple
iv) IBM
v) Silicon Graphics

c) Multimedia writers are typically involved in writing all of the following except:
   i) Proposals
   ii) Script voice-overs
   iii) Actor’s narrations
   iv) Authoring-language scripts
   v) text screens to deliver messages

d) Which of the following provides a system for dynamically displaying a font?
   i) CSS
   ii) Postscript
   iii) HTTPD
   iv) Serif
   v) WYSIWYG

e) Sequencing software:
   i) Places audio clips in order in a sound track.
   ii) Records and edits MIDI data.
   iii) Applies filters to digital audio clips in a predetermined order.
   iv) Manages a project by creating a timeline of events.
   v) Helps synchronize images with a sound track.

f) Which image file type is best for photographs?
   i) Vector
   ii) Encapsulated postscript
   iii) Bitmap
   iv) Shock wave
   v) Laser

g) Which of the following is not a native windows graphics file format?
h) The standard frame rate of computer animations is:
   i) 10 frames per second
   ii) 15 frames per second
   iii) 24 frames per second
   iv) 30 frames per second

i) MPEG stands for ____________________

j) A touchscreen is recommended for:
   i) Pressure-sensitive drawing and painting.
   ii) Projects that track users.
   iii) Day-to-day computer work.
   iv) Programs involving public inputs and simple tasks.
   v) All of the above.

UNIT-I

Q.2   a) Qualify various characteristics of multimedia: nonlinear Vs linear content

   b) Describe the four primary stages of a project.

Q.3   a) List the multimedia skill categories related to the information and interface of a project.

   b) Why are multimedia projects most frequently performed by teams? Whose responsibility is it to ensure that team operates effectively? What can be done to promote team effectiveness?
UNIT-II

Q.4 Define multimedia, interactive multimedia, hypermedia, hypertext, links, anchors, and nodes.

Q.5 a) Discuss the importance of text in a multimedia presentation.

b) List at least three factors that affect the legibility of a text.

UNIT-III

Q.6 a) Define MIDI and list its attributes.

b) Define digital audio and discuss its attributes, including how sound is sampled and what are various sampling parameters.

Q.7 a) Describe the capabilities and limitations of bitmap images.

b) Cite the various file types used in multimedia.

UNIT-IV

Q.8 a) Define animation and describe how it can be used in multimedia.

b) Discuss the origins of cell animation and define the words that originate from this technique.

Q.9 a) Discuss the basic differences between 2D and 3D animation. Which one is better and how?

b) Define: tweening, morphing, keyframe, guide with reference to animation.
End Semester Examination, May 2016

BCA - Sixth Semester

INSTALLING, CONFIGURING, MAINTAINING AND TROUBLESHOOTING A PC/Networking AND PERIPHERALS AND WORKING WITH MS-OFFICE (BCA-605)

Time: 3 hrs

Max Marks: 75

No. of pages: 2

Note: Attempt FIVE questions in all; Q.1 is compulsory. Attempt any TWO questions from Part A and TWO questions from Part B. Each question carries equal marks.

Q.1 a) A distributed network configuration in which all data/information pass through a central computer is:

i) Bus network.
ii) Star network.

iii) Ring network. iv) Point to point network.

b) The slowest transmission speeds are those of:

i) Twisted pair cable. ii) Coaxial cable.

iii) Fibre-optic cable. iv) Microwaves.

c) A hard disk is divided into tracks which are further subdivided into ________.
i) Cluster.
ii) Sectors.

iii) Vectors.
iv) Heads.

d) KPO stands for _______.

e) Which best describes a fragmented hard drive?

i) The platters are bad.

ii) Data files are corrupted.

iii) Clusters of data are damaged.

iv) Files are not stored in consecutive clusters.

f) If a computer BIOS allows it, you can boot from CD-ROM:

i) True

ii) False

g) EISA stands for _______.

h) You just installed a new IDE hard drive, but your system BIOS will not recognize the new drive, what should you check first:

i) Cable sequences.

ii) Jumpers on the hard drive.

iii) Drivers that need to be loaded .

iv) Hard drive manufacturer website information.

i) Hot swapping is _______.

j) List two manufacturer of CPU.

1 ½x10

PART-A

Q.2)  a) “Now the BPO concept encompasses a number of process that are considered non-care to the primary business strategy”. What are the various services offered by BPO companies?

5

b) Explain the booting procedure of computer system.

10
Q.3  
a) What are the steps that needs to be carried out for preventative maintenance in computer system? 7

b) Differentiate between cold booting and hot booting. 3

c) Write down the steps to troubleshoot monitor if the display is not coming. 5

Q.4  
a) Write down the steps to troubleshoot mouse if it is not detected by the computer system. 4

b) What is RAM? Explain the types of RAM. 8

c) What is fragmentation? How it can be removed from the computer system? 3

PART-B

Q.5  
a) Write short notes on:
   i) Email-spoofing.
   ii) Hijacking.
   iii) Packet sniffing.
   iv) Denial of service. 3x4

b) Differentiate between ‘active hub’ and ‘passive hub’. 3

Q.6  
a) What are network security threats? How computer security threats can be mitigated? 7

b) Write short notes on:
   i) Switch.  
   ii) Bridge.
iii) Router.
iv) Repeater.

Q.7   a) Explain the approaches of green computing.

    b) Write short notes on:
       i) Star topology.
       ii) Hybrid topology.

    c) Differentiate between ‘virus’ and ‘worm’.
Q.1 Multiple choice questions:

a) The amount of data that a disk may contain is known as the disk's:
   i) Volume  ii) Size  iii) Storage capacity

b) Which storage device can not be erased?
   i) CD-ROM  ii) Floppy disk  iii) Magnetic tape

c) Which part of the computer performs arithmetic calculations?
   i) ALU  ii) Registers  iii) Logic bus

d) Travel agents use this computer system while reserving flights:
   i) Super computers  ii) Personal computers  iii) Mainframe computers

e) What are you most likely to use while playing a computer game?
i) Touch screen
   ii) Light pen
   iii) Joystick

f) In which language is source program written?
   i) English
   ii) Symbolic
   iii) High level
   iv) Temporary

g) A daisy wheel is a type of:
   i) Printer
   ii) Plotter
   iii) Scanner
   iv) Memory

h) Formatting a disk results in all the data being:
   i) Deleted from the disk
   ii) Copied from the disk
   iii) Saved to the disk

i) Who is known as the father of computer?
   i) Charles Babbage
   ii) John Von Neumann
   iii) Bill Gates
   iv) Sir Clive Sinclair

j) Which chip is responsible for storing permanent data and instructions?
   i) RAM chip
   ii) ROM chip
   iii) DRAM chip

1½x10

UNIT-I

Q.2 a) What is a computer? Explain some of the important characteristics of computer.

8

b) What is an input interface? How does it differ from an output interface?

7

Q.3 a) Explain how a cache memory helps in improving the overall processing speed of a computer system.

8

b) Differentiate between UVEPROM and EEPROM.

7

UNIT-II
Q.4 Write short notes on:
   a) Joystick.  
   b) Track ball.  
   c) Scanner.  

Q.5 What is a hard disk? Name three different types of hard disks. How a hard disk is different from an optical disk? Explain with an example.

UNIT-III

Q.6 a) How does program design relate to program efficiency? 
   5  
   b) Write a short note on running and debugging of program. 
   5  
   c) What is a modular approach? Explain 
   5

Q.7 Draw a flowchart and also write an algorithm for checking a number of palindrome. Also perform the dry run and show the results.

UNIT-IV

Q.8 Write short notes on:
   a) Structured programming.  
   b) Top down approach.  
   c) Bottom up approach .  

Q.9 Explain control structures in relation to an algorithm and a flowchart. Illustrate the use of control structures with the help of a suitable example.
Q.1 a) Point out the errors, if any, in the following C statements:

i) \textbf{m\_inst}=rate of int*amount total;

ii) \textbf{3.14}\textbf{\* \textbf{r}\textbf{\* \textbf{r}}\textbf{\* \textbf{h=volume\_cylinder;}}

3

b) Which of the following is not an infinite loop?

i) int \textbf{i}=1;
for (;;);

while (1)
{
    \textbf{i++};
}

iii) int \textbf{true}=0, false;
\textbf{x}=0

while (true)

iv) int y, 
\textbf{do}

{ 
    
    False=1;
    y = x ;

} while (x ==0); 2

c) Fill in the blanks:

i) To avoid repetition of code and bulky programs functionally related statements are isolated into a _______.

ii) _______ are variables which hold addresses of other variables.

iii) Array elements are stored in ________ memory locations and so they can be accessed using pointers.

iv) A string is nothing but an array of characters terminated by ________.

1½x4

d) What is the purpose of malloc function?

2

e) How structure elements are accessed?

2

UNIT-I

Q.2 What do you understand by a constant, variable and keyword? What are the difference between them. Also list down at least 5 constants, 5 variables and 5 keywords used in C.

15

Q.3 Two numbers are input through a keyboard into two locations A and B. Write a program in C to interchange the contents of A and B.

15

UNIT-II

Q.4 Discuss:  
a) For loop  
b) While loop  
c) Break statement  

15
Q.5 Write a function that receives marks obtained by a student in 3 subjects and returns the average and percentage of these marks. Call this function from main() and print the results in main().

Q.6 What do you understand by a structure? What are the uses of a structure? Give an example of a structure and show how to access structure elements and how structure elements are stored?

Q.7 Create a structure to specify data of students given below:
Rollno, name, department, course, year of joining
Assume that there are not more than 450 students in the college.

a) Write a function to print names of all students who joined in a particular year.
b) Write a function to print the data of a student whose roll number is given.

Q.8 What do you understand by organization of data? What are the various operation that can be carried out on a file? Discuss any two of them using C programming.

Q.9 Suppose a file contains student’s records with each record containing name and age of a student. Write a name and age of a student. Write a program to read these records and display them in sorted order by name.

End Semester Examination, May 2016
Q.1 Choose the correct option:

a) The most populous state of India is:
   i) West Bengal       ii) Kerala
   iii) U.P.            iv) Bihar

b) A large proportion of children in a population is a result of:
   i) High birth rate       ii) High death rate
   iii) High life expectancies iv) More married couples

c) Algal bloom results in:
   i) Global warming       ii) Salination
   iii) Eutrophication     iv) Biomagnification

d) Taj Mahal at Agra may be damaged by:
   i) Sulphur dioxide     ii) Chlorine
   iii) Hydrogen          iv) Oxygen

e) Gas leaked in Bhopal tragedy:
   i) Ethyl isocynate     ii) Potassium
   isothiocyanate
   iii) Methyl isocyanate iv) Sodium isothiocyanate
f) A population is a group of:
   i) Individuals in a species  
   ii) Species in a community  
   iii) Communities in an ecosystem  
   iv) Individual in a family  

g) Human population curve is a:
   i) S shaped curve  
   ii) Parabola curve  
   iii) J shaped curve  
   iv) Zig zag curve  

h) The statistical study of population is called:
   i) Density  
   ii) fecundity  
   iii) Dispersion  
   iv) Mortality  
   v) Demography  

i) Nirodh and Saheli are example of ________ device.

j) Who is India’s current environment minister? 
   
   1½x10

UNIT-I

Q.2  a) Differentiate between renewable and non-renewable resources with an example. 
   8

   b) Explain in detail the structure and function of the ecosystem. 
   7

Q.3  a) How does public awareness about natural resources and environment help to conserve environment? 
   8

   b) What do you mean by judicial use of sustainable resources? 
   7

UNIT-II

Q.4  a) What do you mean by producers, consumers and decomposers? How important is everybody’s role in environment? Explain. 
   8
b) Explain ecological succession with an example.

Q.5
a) Write a short note of 10% law of energy transfer in a food chain.

b) Depict through flow charts:  
   i) Food chain  
   ii) Food web

UNIT-III

Q.6
a) Explain the effects and control measures of different types of pollution.

b) What are the major causes of ozone layer depletion?

Q.7
a) How can effective consumerism and utilization of waste products help in saving environment?

b) State Environmental Protection Act.

UNIT-IV

Q.8
a) What do you mean by population explosion? What are the various steps to control population?

b) How can awareness about human rights and value education help people?

Q.9
a) What are the causes and symptoms of HIV/AIDS? How is it transferred from one individual to another?

b) Mention the role of different welfare programmes conducted from time to time by the Govt.
End Semester Examination, May 2016

BCA -First Semester

BASIC MATHEMATICAL SKILLS (BCA-1004)
Q.1  a) Define a square matrix.
   
b) Solve: \(8^{-2/3}\).
   
c) Complete the formula: \(\log_a mn = \log_a m + ________\).
   
d) The 5th term of A.P. is: 9, 12, 15, 18, .... is ________.
   
e) What is a non-singular matrix?
   
f) Find cofactor of \(A_{22}\) of the matrix
   \[
   A = \begin{bmatrix}
   -1 & 0 \\
   0 & 2
   \end{bmatrix}.
   \]
   
g) If \(A = \begin{bmatrix}
   -1 & 2 \\
   2 & 4
   \end{bmatrix}\) and \(B = \begin{bmatrix}
   3 & 2 \\
   2 & 1
   \end{bmatrix}\). Find \(A - B\).
   
h) Give the full expression for Maclaurien’s series.
   
i) What are allied angles?
   
j) \(\lim_{x \to a} \left[ \frac{f(x)}{g(x)} \right] = ?\)
   
\[1 \frac{1}{2} \times 10\]

UNIT-I

Q.2  a) If \(A = \begin{bmatrix}
   5 & -1 \\
   3 & 2
   \end{bmatrix}\) and \(B = \begin{bmatrix}
   -4 & 3 \\
   1 & -2
   \end{bmatrix}\), then find the matrix \((X)\) such that:
\[3A - 2B + 3X = 0.\]
b) If \( A = \begin{bmatrix} 1 & 3 \\ 2 & 4 \end{bmatrix} \), then find \( A^{-1} \).

Q.3 a) Verify Cayley-Hamilton theorem for the given matrix \( A \):

\[
A = \begin{bmatrix} 3 & 2 & 7 \\ 2 & 3 & 2 \\ 5 & 9 & 10 \end{bmatrix}
\]

b) Find the rank of matrix:

\[
A = \begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 2 \\ 3 & 3 & 1 \end{bmatrix}
\]

UNIT-II

Q.4 a) Find the sum of first 100 even natural numbers divisible by 5.

b) Find the middle term in the expansion of

\[
\left[ \frac{3x^2}{2} - \frac{1}{3x} \right]^6
\]

UNIT-III

Q.5 a) How many words can be formed from the letters of the word 'DAUGHTER', taking all the letters together?

b) Prove that: \( \frac{3 \cdot 2^{2n+1} + 2^n}{2^n + 2^{n-1}} = 2 \)

Q.6 a) Prove that:

\[
\frac{\sin A + 1 - \cos A}{\sin A - 1 + \cos A} = \frac{1 + \sin A}{\cos A}
\]
b) Find the value of: 

\[ \log 2 + 16 \log \frac{16}{15} + 12 \log \frac{25}{24} + 7 \log \frac{81}{80} = 1 \]

Q.7 a) Prove that: \( \cos 52^\circ + \cos 68^\circ + \cos 172^\circ = 0 \).

b)

\[ \frac{\log \sqrt{27} + \log \sqrt{8} - \log \sqrt{125}}{\log 6 - \log 5} = \frac{3}{2} \]

UNIT-IV

Q.8 a) For what value of \( k \) is the following function continuous at \( x = 2 \)?

\[ f(x) = \begin{cases} 
\frac{x^2 - 4}{x - 2}, & x \neq 2 \\
 k, & x = 2 
\end{cases} \]

b) Evaluate:

\[ \lim_{x \to 0} \frac{\sin x^2}{x} \]

Q.9 a) Differentiate w.r.t. \( x \) :

\[ \frac{3x + 2}{(x + 5)(2x + 1) + 3} \]

b) Expand \( \log(1 - x) \) in powers of \( x \) by Maclaurin’s theorem.

End Semester Examination, May 2016

BCA -First Semester

ENGLISH LANGUAGE PROFICIENCY-I (BCA-106/BCA-1005)
Q.1  Answer the following questions (ANY FIVE):
   a) What are adjectives? Give an example.
   b) What are voiced and unvoiced consonant sounds?
   c) What are the two types of calls?
   d) What are the three types of vowel sounds?
   e) How many vowels and consonants are there in English alphabet, name them?
   f) What are the types of nouns?  
      2x5

Q.2  Underline the sound for the given VOWEL SOUNDS:
   a) Ocean
   b) Might
   c) Team
   d) Same
   e) Apple  
      1x5

Q.3  Fill in the blanks with “a”, “an” or “the”:
   a) London is _________ very costly place to live in.
   b) We discussed _________ matter seriously.
c) Man, thou art ________ wonderful animal.

d) I went to ___________ airport at 6:00 AM yesterday.

e) Uncle Peng rows his boat with ___________ oar.

Q.4 Write the contracted form of the given words:

a) They + will = ___________.

b) You + are = ___________.

c) Were + not = ___________.

d) You + have = ___________.

e) They + had = ___________.

Q.5 Fill in the blanks with a suitable determiner,

a) May I taste a ________ of the soup that you cooked in the morning?

b) Let’s do ________ shopping while we’re in town.

c) My brother had _________ good news for me.

d) I had ________ of this nonsense. Now I’ll not tolerate anything.

e) The head is the _________ sensitive part of the body.

Q.6 Underline the consonant sounds in the given words:

a) CAUSE

b) TAP

c) TARGET

d) SCENT

e) ZONE
Q.7  **Change the following sentences into (given in brackets):**

a) He doesn’t like playing video games.  
   (positive)

b) I like to going to Cinema.  
   (negative)

c) Did the burglar steal anything valuable?  
   (positive)

d) He doesn’t enjoy fishing.  
   (interrogative)

e) Do you think they are going to win the match?  
   (negative)

1x5

Q.8  **Use the Present Continuous / Simple Past / Present Perfect Continuous / Past Perfect Continuous in the following sentences:**

a) The whole day yesterday the boys ________ to the cricket commentary.

b) When I ________ to the hospital, the doctor ________ the operation.

c) I ________ the assignment before the bell ________.

1x5

Q.9  **Arrange the words to make sentences:**

a) kicking/ and soon/ to play with/ we started/ a tennis ball around/ we were allowed/ a real football.

b) one of these/ that/ my second fight/ it was/ football matches/ I was led into/ as a result of.

c) from sores/ and/ on my head/ as a boy/ on my legs/ I suffered terribly.

d) ship/ violently/ the storm/ rocked/ the.

e) i/ caught/ in/ caught/ read/ had/ the/ that/ paper/ burglar/ been/ had/ the.

f) wore/ he/ a/ hat/ fiber/ of/ on/ coconut/ head/ his/ made.

g) gift/ free/ a/ dad/ offered/ firm/ by/ the/ was.
h) the storm shed damaged the was during.

i) parts many coffee popular in world the is very of.

j) cave could explore not they torch the without a.

\[1\times10\]

Q.10 Write a paragraph on the topics given below in 100 words:

a) Social networking sites.

b) To be an effective CEO.

\[5\times2\]

Q.11. Answer any two questions in 80-100 words:

a) How do dogs make wonderful pets?

b) Is it important to be ready before buying a house?

\[5\times2\]
Q.1 a) Given the following traversal calculate the post order traversal

In order traversal = \{4,2,5,1,3,6\}

Preorder traversal = \{1,2,4,5,3,6\}

b) How sparse matrix can be represented in memory?

c) Queue is based on LIFO (True/False)

d) What is hashing? How an array could be defined?

e) Write a sample B+ tree.

f) What do you mean by space analysis of an algorithm?

g) What do you mean by Heap?

h) Write run time complexity of merge sort in best, average and worst case.

i) What data structure can be used for polynomial manipulation?

j) Write one sample binary search tree.

UNIT-I

Q.2 Write short notes on the following:

a) Differentiate between linear and nonlinear data structure.

b) Asymptotic notations.

UNIT-II

Q.3 a) How arrays are represented in memory? Describe the formula for calculating the address of any element of a two dimensional array.

b) What is sparse matrix and how it can be represented?

Q.4 a) What do you mean by dynamic memory management? Create a circular link list using dynamic memory and show its advantages over linear link list.
b) Describe the application of Stack in Recursion. 6

Q.5  a) Write a program for doubly link list implementation. 8
     b) Explain BFS and DFS algorithms. 7

UNIT-III

Q.6  a) Write a note on threaded binary trees. 6
     b) Write down the non-recursive algorithm for pre order traversal of binary tree. 9

Q.7  a) Describe the Kruskal's algorithm in detail. 8
     b) How general tree can be converted into binary trees? 7

UNIT-IV

Q.8  a) What is hashing? What is the condition for collision? How collision can be resolved? 7
     b) Write merge sort algorithm and derive the expression for its run time complexity in best, average and worst case. 8

Q.9  a) Describe the insertion sort algorithm and trace the steps of insertion sort for sorting the list: 12,19,33,26,29,35,22. Find the total number of comparisons made. 9
     b) Write binary search algorithm for an array. 6

End Semester Examination, May 2016

BCA -Second Semester

DATABASE SYSTEMS (BCA-2002)
Q.1  a) A subschema expresses:
   i) The logical view
   ii) The physical view
   iii) The external view
   iv) All of the above

b) The model which uses plex structure as its basic structure is:
   i) Relational model
   ii) Network model
   iii) Hierarchical model
   iv) None of the above

c) The 3NF removes:
   i) Functional dependency
   ii) Transitive dependency
   iii) Multivalued dependency
   iv) Fully functional dependency

d) A __________ is an association among several entities.
   i) Relationship
   ii) Key
   iii) Partial
   iv) None of these

e) Security measures can be taken at:
   i) Physical level
   ii) Human level
iii) Operating system level  iv) All of
the above

f) The causes of failures includes:
   i) System crash  ii) Media failure
   iii) User error  iv) All of the above

   g) What is a relationship called when it is maintained between two entities?
      i) Unary  ii) Binary
      iii) Ternary  iv) Quatenary

   h) DROP is a __________ statement in SQL.
      i) QUERY  ii) Embedded SQL
      iii) DDL  iv) DCL

   i) The term deadlock is related to:
      i) Database recovery  ii) Database security
      iii) Concurrency management  iv) Database transaction

   j) Count function in SQL returns the number of:
      i) Values  ii) Distinct values
      iii) Groups  iv) Columns $1 \frac{1}{2} \times 10$

UNIT-I

Q.2 a) Explain three level architecture of a DBMS. Explain with the help of an example.
b) What are the DBMS languages? Explain in brief. 

Q.3 Define entity and entity set. Describe the various attributes and relationship constraints in ER diagram with an example.

UNIT-II
Q.4  a) Explain the types of constraints. 

b) What is relational algebra? Explain any three relational operators with examples.

UNIT-III
Q.5 Explain following SQL commands with proper syntax and examples:

a) Create.

b) Insert.

c) Alter.

d) Delete.

e) Update.

UNIT-IV
Q.6  a) What are the types of modification anomalies? Explain with examples.

b) Explain 1NF, 2NF, 3NF by using suitable examples.

Q.7 Define concurrency. Discuss why concurrency control is needed and explain with an example. Also discuss concurrency problem in brief.
Q.8 What is deadlock? Explain the deadlock prevention protocols. What do you mean by starvation?

15

Q.9 What do you mean by data security? Describe various defence mechanisms for database security.

15
Note: Attempt **FIVE** questions in all; **taking at least ONE question** from each **UNIT**. **Q.1 is compulsory**. All questions carry equal marks.

Q.1  

a) Radix of an octal number system is:  
   i) 0  
   ii) 2  
   iii) 4  
   iv) 8  

b) How many flip flops are required for a 16 bit register?  
   i) 8  
   ii) 16  
   iii) 32  
   iv) None of these  

c) How many 2K × 8 ROM chips would be required to build a 16K × 8 memory system?  
   i) 2  
   ii) 4  
   iii) 8  
   iv) 16  

d) The 8-input XOR circuit shown has an output of Y=1. Which input combination below (ordered A - H) is correct?  
   i) 1011100  
   ii) 1011000  
   iii) 11100111  
   iv) 00011101  

![8-input XOR circuit diagram]

e) How many outputs are there for a BCD decoder?  
   i) 4  
   ii) 16  
   iii) 8  
   iv) 10  

f) The unit in the micro-processor that provide the arithmetic and logic functions are called:  
   i) CPU  
   ii) ALU  
   iii) I/O  
   iv) None of these  

g) How can a JK Flip-Flop made to toggle?  
   i) J=0 K=0  
   ii) J=0 K=1  
   iii) J=1 K=0  
   iv) J=1 K=1  

h) If P and Q are two inputs to a 4 bit comparator, sizes of P and Q are:  
   i) 4 and 2  
   ii) 2 and 2  
   iii) 4 and 4  
   iv) 2 and 4  

i) A Full Adder circuit can be implemented by using:  
   i) 3 Half Adder  
   ii) 2 Half Adder  
   iii) 2 Half Adder and OR gate  
   iv) 1 Half Adder and OR gate
j) Which among the below stated Boolean expressions obey De-Morgan's theorem?

i) \( \overline{X + Y} = \overline{X} \cdot \overline{Y} \)  
ii) \( X \cdot Y = X + Y \)  
iii) \( X \cdot Y = \overline{X} + Y \)  
iv) None of these

**UNIT-I**

Q.2 Do the following conversions:

a) \((27.5)_{10}\) to binary.

b) \((BABA)_{16}\) to decimal.

c) \((10110.0101)_{2}\) to octal.

d) \((101100111)_{2}\) to BCD code.

e) \((11010)_{2}\) to Gray code.

Q.3 What do you mean by Error Detecting and Correcting codes? Explain with examples.

**UNIT-II**

Q.4 a) i) Which are the two universal gates in digital system? Explain.

ii) Implement the logic of IC 7486 using any one universal gate.

b) i) Minimize the below logic function using K-Map and write the simplified SOP and POSexpressions.

\[ F(A,B,C,D)=\Sigma m(0,1,2,3,5,7,8,9,11,14) \]

ii) Prove the following using Boolean algebraic Theorems:

\[ \overline{A}BC + A \overline{B}C + AB\overline{C} + ABC = AB + BC + AC \]

Q.5 a) i) How XOR gate is different from OR gate? Explain.

ii) Implement the logic of one universal gate using another universal gate.

b) i) Prove the following using Boolean Theorems:

\[ B \oplus (B \oplus A \cdot C) = A \cdot C \]
ii) Minimize the below logic function using K-Map and implement the simplified SOP Expressions using logic gates.

\[ F(A,B,C,D) = \Sigma m(4, 6, 10, 12, 13, 15) \]

**UNIT-III**

Q.6  
   a) Explain and implement Full Adder.  
   
   b) What do you understand by 8:1 Mux? Explain.  
   
   c) Implement 3 bit synchronous up down counter.

Q.7  
   a) What is the difference between De multiplexer and Decoder? Explain.  
   
   b) Implement the logic of Full Subtractor.  
   
   c) Explain the concept of SISO and PIPO shift Registers.

**UNIT-IV**

Q.8  
   Differentiate between:
   
   a) Volatile and Non-volatile memory.  
   
   b) RAM and ROM.  
   
   c) Cache and Virtual Memory.

Q.9  
   What are the basic components of Microprocessor? What do you mean by Parallel Processing?

**End Semester Examination, May 2016**  
BCA – Second Semester  

**CONCEPTUAL FOUNDATION OF MANAGEMENT (BCA-2004)**
Q.1 State True or False:

a) Management is a continuous process.
b) By definition, all effective managers are true leaders.
c) The correspondence between actions and words is integrity.
d) A directive style is more appropriate when subordinate ability is high.
e) According to Maslow, once a need is satisfied, it becomes a powerful monitor.

Fill in the blanks:

f) _________ is an art of getting things done through others.
g) _________ is called the faller of modern management.
h) _________ is a financial statement prepared for the definite period of time.
i) _________ indicates minimum delegation.
j) In _________ organization, decentralization is suitable.

UNIT-I

Q.2 What is management? Explain the process of management.

Q.3 Compare “Henry Fayol” and “Taylor” principles of management. Which one is better and why? Explain your answer by taking an example.

UNIT-II

Q.4 “Planning is looking ahead and control is looking back“. Comment.

Q.5 Write short notes on:

a) Steps in planning.
b) Process of decision making.

UNIT-III
Q.6  
   a) Explain the difference between formal and informal organization.  
   b) Define organization. What are its basic functions? Explain in detail.

Q.7  
   Explain departmentalization and its subtypes in detail.

UNIT-IV

Q.8  
   Evaluate any two theories of leadership with Indian examples.

Q.9  
   What is leadership? Explain characteristics of different leadership styles in detail.

End Semester Examination, May 2016
BCA – Second Semester
ENGLISH LANGUAGE PROFICIENCY-II (BCA-2005)

Time: 3 hrs  
Max Marks: 75
No. of pages: 2

Note: Attempt ALL questions:
Q.1  **Answer the following questions:**

a) What is syllable or word-stress? What is the importance of it in English pronunciation? Give some common examples on word-stress.

b) What are the various types of pronouns? Discuss.

c) What are Articles? What is the use of Articles in writing English Language sentences?

d) Illustrate the use of following preposition with example:
   i) In front of
   ii) Besides
   iii) Behind

e) What is ranking scale questions? Write two examples for ranking scale questions.

2×5

Q.2  **Fill in the blanks with correct pronouns:**

a) I really like watching old shows. ______ are some of the best things on TV.

b) After the parade, ______ met up in the town square.

c) ______ do you want for lunch?

d) She bought ______ a new car.

e) Thanks for the package! Please leave ______ on the table.

2×5

Q.3  **Break into syllables and write the number of syllables:**

a) Misbehaving  

b) Worrying

c) Chicken  

d) Free

e) Banana

2×5

Q.4  **Fill in the blanks with appropriate ARTICLE “a”, “an” or “the”:**

a) Did your bring ______ umbrella?

b) Are you looking for ______ shampoo?
c) Check _________ mailbox again.
d) Can I have _________ spoon please?
e) I was born into _________ poor family.
f) She will be back in _________ hour.
g) I would love to talk to one of _________ managers.
h) What _________ amazing view?
i) I felt _________ bit depressed.
j) This song was very popular in _________ 1980. \textbf{1 \times 10}

Q.5 \textbf{Complete the exercise with correct prepositions:}

a) _________ the picture, I can see a woman.
b) The woman is sitting _________ table.
c) There is another chair _________ the woman.
d) The woman is looking _________ he laptop.
e) The woman is holding a cup _________ her hands.
f) I want to loose 5 kgs. _________ one month.
g) I believe _________ the neat life.
h) This painting is mostly _________ blue.
i) I am good _________ drawing a portrait.
j) We saw a baseball game _________ the stadium. \textbf{1 \times 10}

Q.6 \textbf{Fill in the blanks with appropriate form of verbs:}

a) John (arrange) _________ all the books on the shelf an hour age.
b) Don’t (eat) _________ that.
c) Jama and Lauren (like) _________ to read books about horses.
d) Often, I (take) _________ the train to work.
e) Those brownies were (bake) _________ this morning.
f) The trainers were very expensive, I couldn’t afford to _________ (buy) them.
g) I asked if he (lend) _________ me his book.
h) She (play) _________ the piano since she was ten.
i) I (not do) _________ the shopping yet.
j) While I (talk) _________ to hi, someone stole my car.

Q.7 Fill in the blanks using appropriate modals:

a) _________ I come with you?
b) The president said he _________ come.
c) You _________ take an umbrella. It’s starting to rain.
d) Tomorrow I _________ be in New York.
e) Julie _________ swim when she was four years old.

Q.8 Answer the following question in 80–100 words:

Do you think the Tiger is better in zoo cage or in the wild life?

Q.9 Write a paragraph on topics given below in 100 words:

a) Global Warming.
b) Life of a Teenager.
End Semester Examination, May 2016

BCA -Third Semester

PROGRAMMING IN C++ (BCA-3001)

Time: 3 hrs

Max Marks: 75

No. of pages: 2

Note: Attempt FIVE questions in all; taking at least ONE question from each Unit. Q.1 is compulsory. All questions carry equal marks.
Q.1 Multiple choice questions:

a) The major goal of inheritance in C++ is:
   i) To facilitate the conversion of data types.
   ii) To help modular programming.
   iii) To facilitate the reusability of code.
   iv) To extend the capabilities of a class.

b) Which type is best suited to represent the logical values?
   i) Integer
   ii) Boolean
   iii) Character
   iv) All of the above.

c) Which of the following concept means determining at run time what method to involve?
   i) Data hiding
   ii) Dynamic typing
   iii) Dynamic binding
   iv) Dynamic loading

d) When a function is defined inside a class, this function is called?
   i) Inside function
   ii) Class function
   iii) Inline function
   iv) Interior function

e) Where does the execution of the program starts?
   i) User defined function
   ii) Main function
   iii) Void function
   iv) None of the above

f) The friend function are used in situations where?
   i) We want to exchange data between classes.
ii) We want to have access to unrelated classes.

iii) Dynamic binding is required.

iv) We want to create versatile overloaded operators.

g) Constructions are used to:

i) Initialize the objects

ii) Construct the data members

iii) Both i) and ii)

iv) None of the above

h) What is an overloaded constructor?

i) A constructor with too many program statements.

ii) A second constructor with the same constructor heading as the first constructor.

iii) A second constructor with a different identifier than the first constructor.

iv) A second or other multiple constructor with a different signature than any other constructor.

i) Which keyword is used to check exception in the block of code?

i) Catch

ii) Throw

iii) Try

iv) None of the above

j) Which function allows you to set minimum width for the next input?

i) Setfill

ii) Setro

iii) Setwidth

iv) None of these

UNIT-I

Q.2 Explain the basic concepts of object oriented programming with examples. 15

Q.3 Describe data types in C++ in details. 15
UNIT-II
Q.4 Discuss the role of constructors and destructors in a class. State the rules and types associated with them.

Q.5 What are strings? Are they standard or derived data types? Write an interactive program to check whether a given string is a palindrome or not.

UNIT-III
Q.6 Define operator overloading. Explain how to overload unary operator and binary operator with programming examples.

Q.7 a) What are the differences between inheriting a class with public and private visibility mode? Explain with examples.

b) Justify the need for virtual function in C++.

UNIT-IV
Q.8 Explain in detail about exception handling in C++.

Q.9 What is a manipulator in C++? Differentiate between manipulators and IOS functions.
Q.1 a) What is spoofing?

b) Write two applications of mobile.

c) Give the concept of lettering.
d) What is SIM?

e) What is the role of IT in Banking?

f) Define Web Jacking?

g) Technology that helps companies to change business by allowing them to use new methods is __________.

h) What operating system is used as the base of the android?

i) Define Artificial Intelligence.

j) What is software as a service?  \[1\frac{1}{2} \times 10\]

UNIT-I

Q.2  
a) “Smartphone is better than a traditional phone”. Justify your answer.  \[7\]

b) What is the most commonly used mobile platform? Explain its features also.  \[8\]

Q.3  
a) Compare: 3G and 4G of wireless communication technology.  \[7\]

b) What is the importance of Android in the mobile market? Write some disadvantages of Android.  \[8\]

UNIT-II

Q.4  
How can one say that the cloud computing visualizes the different cloud models with respect to services? How does it take into account that different types of services can be offered as cloud services? Explain.  \[15\]

Q.5  
a) What are the key benefits of Saas model? Explain.  \[7\]

b) Explain the security and privacy challenged in cloud computing.  \[8\]

UNIT-III

Q.6  
Write short notes on:

a) E-mail spoofing.

b) Password sniffing.

c) Hacking.  \[5 \times 3\]
Q.7 What is computer network intrusion? How can one protect himself from network intrusion? 15

UNIT-IV

Q.8 a) How E-Commerce has changed the today’s life? Explain. 8
b) Compare: E-Commerce and M-Commerce. 7

Q.9 What is data mining? Explain the role of it in banking and marketing. 15

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End Semester Examination, May 2016

BCA – Third Semester

NUMERICAL ANALYSIS AND STATISTICAL TECHNIQUES
(BCA-3003)

Time: 3 hrs
Max Marks: 75
No. of pages: 2

Note: Attempt FIVE questions in all; taking at least ONE question from each UNIT. Q.1 is compulsory. All questions carry equal marks.

Q.1 a) Interpret the following values of $r$: $r = 0; r = -1; r = +1; r = 0.25$

b) What is random sampling?

c) Order of convergence of regular false method __________ .
d) Find the probability for \( X = 5 \) in binomial distribution with \( n = 10; \ P = 0.5 \).

e) __________ errors are caused by using approximation.

i) Internet  
ii) Roundoff

iii) Truncation  
iv) Numerical

f) A sample can be defined as a:

i) Population of interest to a researcher.

ii) Quota from within the whole population.

iii) Subset of a population representation of the population of interest to the researcher.

g) In bisection method if root lies between \( a \) and \( b \) then \( f(a) \times f(b) \) is:

i) \(< 0\)  
ii) \(= 0\)

iii) \(> 0\)  
iv) None of these

h) In Newton Raphson method for finding the real root of equation \( f(x) = 0 \), the value of \( x \) is given by:

\[
x_0 - \frac{f(x_0)}{f'(x_0)}
\]

i) \(x_0\)  
ii) \(x_0\)

\[
\frac{f(x_0)}{f'(x_0)}
\]

iii) \(x_0\)  
iv) None of these

i) State Lagrange’s interpolation formula.

j) The technique for computing the value of the function inside the given argument is called:

i) Interpolation  
ii) Extrapolation

iii) Partial fraction  
iv) Inverse interpolation

UNIT-I

Q.2 a) Find root of the equation \( x^3 - x - 1 \) using bisection method.
b) Evaluate \( \int_{4x+5}^{5} \frac{dx}{4x+5} \) by Simpson’s 3rd, Simpson’s 8th and Trapezoidal rule. Dividing the range into 10 equal parts.

Q.3 a) Apply R-K method to find approximate value of \( y \) for \( x = 0.2 \) in steps of 0.1 if \( \frac{dy}{dx} = x + y^2 \), given that \( y = 1 \) where \( x = 0 \).

b) Evaluate \( \sqrt{32} \) by using Newton Raphson method.

UNIT-II

Q.4 a) Give \( y_0 = -12 \), \( y_1 = 0 \), \( y_3 = 6 \) and \( y_4 = 12 \); find \( y_2 \).

b) Using Newton’s forward formula, find the value of \( y f(1.6) \) if:

\[
\begin{array}{c|c|c|c|c}
 x & 1 & 1.4 & 1.8 & 2.2 \\
 y & 3.49 & 4.83 & 5.96 & 6.5 \\
\end{array}
\]

Q.5 Explain the method of least square to fit a parabola. Fit a parabola \( a + bx + cx^2 \) to the following data:

\[
\begin{array}{c|c|c|c|c|c|c|c|c|c}
 x & 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 & 9 \\
 y & 2 & 6 & 7 & 8 & 10 & 11 & 11 & 10 & 9 \\
\end{array}
\]

UNIT-III

Q.6 a) The probability that a bulb will fail before 100 hours is 0.2 Bulb fails independently. If 15 bulbs are tested for life lengths, what is probability that the number of failures before 100 hours does not exceed 3?

b) The profit earned by 100 companies during 1998-1999 is shown below:

\[
\begin{array}{c|c|c|c|c|c|c|c|c|c}
 Profit & 20-30 & 30-40 & 40-50 & 50-60 & 60-70 & 70-80 & 80-90 & 90-100 \\
 No. of Companies & 4 & 8 & 18 & 30 & 15 & 10 & 8 & 7 \\
\end{array}
\]

Find the mean, median and mode.
Q.7 The following data relate to the age of 10 employers and number of days on which they reported sick in a month.

<table>
<thead>
<tr>
<th>Age</th>
<th>20</th>
<th>30</th>
<th>32</th>
<th>35</th>
<th>40</th>
<th>46</th>
<th>52</th>
<th>55</th>
<th>58</th>
<th>62</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sick</td>
<td>11</td>
<td>12</td>
<td>10</td>
<td>13</td>
<td>14</td>
<td>16</td>
<td>15</td>
<td>17</td>
<td>18</td>
<td>19</td>
</tr>
</tbody>
</table>

Find the Karl Pearson’s coefficient of correlation and interpret its value. 15

UNIT-IV

Q.8 What do you understand by sampling? Define judgment sampling, quota sampling and convenience sampling. Under what conditions can each of these designs be used to advantage. 15

Q.9 Write short notes on:

a) Type-I and Type-II error.

b) In hypothesis testing process, what is the importance of null hypothesis?

c) “In every hypothesis testing, the two types of errors are always present”. If this is true then explain what is the use of hypothesis testing? 5x3
Q.1  

a) RAD stands for ___________.  
b) SDLC stands for ___________.  
c) In design phase of waterfall model we get ___________ document.  
d) ___________represent the completion of the important stages of project.  
e) System software is combination of ___________ and ___________.  
f) Which is the final outcome of the requirements analysis and specifications phase?  
   i) Drawing the data flow diagram.  
   ii) The SRS document.  
   iii) Coding the project.  
g) In object oriented design of software, objects have:  
   i) Attribute and names only.  
   ii) Operations and names only.  
   iii) Attributes, name and operations.  
   iv) None of the above.  
h) Structure programming code includes:  
   i) Sequencing  
   ii) Iteration  
   iii) Alteration  
   iv) Multiple exit from loops  
   v) Only A, B and C.  
i) The objective of testing is:  
   i) Debugging  
   ii) To uncover errors  
   iii) To gain modularity  
   iv) To analyze system  
j) White Box testing, a software testing technique is sometimes called:  
   i) Basic path  
   ii) Graph testing  
   iii) Data flow  
   iv) Glass box testing  

**UNIT-I**
Q.2 a) What are the principles of software engineering that should be abided by the software development community?  

b) Software is used in almost every area of human beings. Enlist the various fields where softwares are being used.  

Q.3 a) What do you understand by a software process model? Explain waterfall model with its advantages and disadvantages.  

b) Explain the goals of software engineering.  

**UNIT-II**

Q.4 a) List the advantages and disadvantages of using LOC as a metric.  

b) What are the steps to be followed to estimate effort?  

Q.5 Explain in detail the methods available for project scheduling. With an example describe how to track the schedule.  

**UNIT-III**

Q.6 a) What is the different between “White Box Testing” and “Black Box Testing”.  

b) Explain boundary value analysis is detail using suitable example.  

Q.7 Differentiate cohesion and coupling. Explain the types of cohesion in detail with example.  

**UNIT-IV**

Q.8 What is software maintenance? Describe various categories of maintenance. Which category consumes maximum effort and why?  

Q.9 What are various factors that effects software quality? Explain SEI-CMM software quality standards in detail.
Q.1 Answer the following questions (any five):
a) How are sounds different from alphabet in English?

b) What is Indianism?

c) What are the consonant sounds in English?

d) Write a short note on Stress.

e) What is a diphthong? How are diphthongs different from vowel sounds?

f) What are the different types of conjunctions? 2×5

Q.2 Fill in the blanks with the most appropriate conjunctions:

a) Give up smoking __________ face the consequences.

b) He is literate__________not educated.

c) My friend is prodigal,__________his wife is a skinflint.

d) I saw her__________returning from office.

e) __________he pretends to be against hypocrisy, he himself is a hypocrite. 1×5

Q.3 Choose the correct tense in the following sentences:

a) Mr Marshall passed away/ has passed away in the night.

b) On hearing the news, they all drove to/ have driven to their wards staying in hostels.

c) No problem; we have had/ we had our dinner.

d) The poet had died/died last week.

e) I know a girl who has spoken/ spoke five languages. 1×5

Q.4 Write a sentence using the following each homonym:

Peace-piece; sale-sail; cell-sell; face-face; duck-duck 1×5

Q.5 Use the following verbs transitively as well as intransitively:

a) Stop f) Decide
Q.6 Read each sentence below and choose the correct transition word.

a) __________I met my former boy friend; I never really understood the meaning of the word unreliable. Where, Before, First of all

b) One reason people have dogs is for companionship; __________is for protection.

Once, frequently, another

c) __________ angry Birds is a new game; it has quickly become very popular.

Although When In the same way

d) There's no room in your mouth for your wisdom teeth, __________they will have to be removed. For example, so, but

e) Once the referee's back was turned, the manager of "The Demented Shadow" placed a foreign object __________ his boxer's glove. Such as just like inside

Q.7 Transcribe the following words according to IPA:

Notion, electricity, industrial, hopeless, employee, engineer, photography, cultivate, thought, purchase.

Q.8 Replace the following phrases with those that conform to Standard English usage:

a) 'Co-brother/ Co-sister'

b) 'Lesson is delivered'

c) 'Cannot engage one's period today'

d) 'Yesterday evening'

e) 'August audience'
Q.9  Use the given adverbs in their appropriate position:
   a) We see each other now-a-days seldom.
   b) They are late for never work.
   c) What you tell is not enough good.
   d) The story has begun just.
   e) He hasn't done anything wrong really.
   f) We take usually our tea in the garden.
   g) He cracks witty jokes often.
   h) You have to mind always your language in such situations.
   i) She has been informed about the incident already.
   j) Have you seen ever anything like that?  

Q.10  Answer the following questions in 100 words:
   a) What was the last movie you saw? Write about it.
   b) What are your hobbies?

Q.11  Write an article on the following topics in 150 words.
   a) The problem of brain drain.
   b) Corruption in India.
End Semester Examination, May 2016
BCA – Fourth Semester
WEB APPLICATION DEVELOPMENT (BCA-4001)

Time: 3 hrs
Max Marks: 75
No. of pages: 2

Note: Attempt FIVE questions in all; taking at least ONE question from each UNIT. Q.1 is compulsory. All questions carry equal marks.

Q.1 Multiple choice questions:

a) Choose the correct HTML tag for largest heading:
   i) <h1>  ii) <head>  iii) <heading>  iv) <h.6>

b) How can you make a numbered list?
Q.2 Write short notes on:

a) Telnet.

b) FTP.

c) Web browser.

UNIT-I

Q.3 a) What are various steps to create a website?

b) Differentiate between web-client and web server.

UNIT-II

Q.4 What are various types of links available in HTML? Explain with the help of an example.

Q.5 a) What do you mean by tables in HTML? Explain various tags to create table in HTML.
b) Differentiate between colspan and rowspan.

UNIT-III

Q.6 Write syntax to create:
   a) Radio button.
   b) Checkbox.
   c) Text-area.
   d) Submit button.
   e) Reset button.

Q.7 a) What do you mean by frames? What are the various attributes of a frame tag?
    b) How can we tag a frame by using its name?

UNIT-IV

Q.8 What do you mean by dialog box? What are various types of dialog box?

Q.9 a) What are the various operators available in JavaScript?
    b) What are various event handles available in JavaScript?
Q.1 Fill in the blanks:

a) An operating system is a __________ software.

b) __________ system has more than one CPU.

c) In __________ mode machine is executing operating system instructions.

d) The various method of inter-process communication are __________.
e) The mean time from submission to completion of a process is called __________.

f) A process is __________ if it can affect or be affected by other processes executing in the system.

g) The situation in which a process is waiting for another waiting process may lead the system in __________ state.

h) In __________ scheme memory is divided into fixed size blocks called frames and logical memory is divided into fixed size blocks called pages.

i) A process is in __________, if it is spending more time in paging instead of doing its execution.

j) A device controller is a __________ unit.

UNIT-I

Q.2 What is a scheduler? Explain the various types of schedulers.

Q.3 Write short notes on:
   a) Multiprogramming.
   b) Multitasking.
   c) Threads.

UNIT-II

Q.4 a) What are the various forms of inter-process communications? Explain.
   b) Explain banker’s algorithm in detail.

Q.5 Consider a system for the following process with their CPU burst and arrival time as shown below:

<table>
<thead>
<tr>
<th>Process</th>
<th>CPU Burst</th>
<th>Arrival Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>P₀</td>
<td>16</td>
<td>0</td>
</tr>
<tr>
<td>P₁</td>
<td>24</td>
<td>1</td>
</tr>
<tr>
<td>P₂</td>
<td>8</td>
<td>2</td>
</tr>
<tr>
<td>P₃</td>
<td>30</td>
<td>3</td>
</tr>
</tbody>
</table>
Compute the average turnaround time and waiting time using FCFS, SJF and Round Robin scheduling algorithm. Time quantum is 2 sec.  

UNIT-III

Q.6 Explain how logical memory address is transformed into a physical memory address in a paged memory system.  

Q.7 Briefly describe the first fit, best fit and worst fit approaches to contiguous memory allocation.  

UNIT-IV

Q.8 Consider the following queue for request service. Use FCFS, SSTF and SCAN scheduling to calculate the total movement in number of cylinders.  

82, 175, 26, 153, 36, 130, 65, 72, 15, head start at cylinder 45.  

Q.9 Define file system. List four operations on file. Explain the difference between sequential and random access mechanism of file access.  

End Semester Examination, May 2016

BCA -Fourth Semester

MATHEMATICAL FOUNDATION OF COMPUTER SCIENCE
(BCA-4003)

Time: 3 hrs

Max Marks: 75

No. of pages: 2

Note: Attempt FIVE questions in all; taking at least ONE question from each Unit. Q.1 is compulsory. All questions carry equal marks.

Q.1 a) Write ‘Associative law’.
b) \[ A^C \cap B^C \]

c) Draw the directed graph of a relation \( R \) defined on \( A = \{7, 8, 9, 10\} \) as 
\[ R = \{(7,10), (8, 7), (8, 8), (9, 7)\}\]

d) Write the set \( A = \{x : x^2 = 4\} \) in tabular form.

e) Define portioning of a set.

f) CNF in Boolean algebra stands for \( \text{______} \).

g) What is a proposition?

h) L.U.B. in Boolean algebra stands for \( \text{______} \).

i) What is degree of a recurrence relation?

j) Define a circuit.

**UNIT-I**

Q.2 a) In a survey of 300 students, 64 had taken a mathematics course, 94 had taken an English course, 58 had taken a computer course, 28 had taken both a mathematics and a computer course, 26 had taken both an English and mathematics course, 22 had taken both an English and a computer course, 14 had taken all three courses.

i) How many students were surveyed, who had taken none of the three courses?

ii) How many had taken only a computer course?

b) Prove that \( 1 + 3 + 5 + \ldots + 2n - 1 = n^2 \) by principle of mathematical induction.

**UNIT-II**

Q.3 a) How many people at least in a group of (85) people have the same last initials?

b) Find the gcd of 656 and 125 and express: \( d = m \cdot 656 + n \cdot 125 \) where \( d \) is the gcd of 656 and 125.
Q.4 Solve the difference equation \(2a_r - 5a_{r-1} + 2a_{r-2} = 0\) and find particular solution such that \(a_0 = 0\) and \(a_1 = 1\)

Q.5 Prove that the statement \((p \rightarrow q) \iff (\sim q \rightarrow \sim p)\) is a tautology.

UNIT-III

Q.6 a) Define a Boolean algebra. What are the maxterms?

b) If \(f(x, y, z) = x \land (y \lor z)\) be a given Boolean function. Determine its disjunctive normal form.

UNIT-IV

Q.7 a) Define a distributed lattice along with an example.

b) Let \(P(s)\) be the power set of the set \(s = \{1, 2, 3\}\). Construct the Hasse diagram of the partial order induced on \(P(s)\) by the lattice \((P(s), \land, \lor)\)

Q.8 a) Discuss Eulerian path and Eulerian circuit along with an example.

b) Consider the directed graph shown below. Determine its adjacency matrix \(M_A\)
Find the shortest path between (a) and (Z) in the given graph.

End Semester Examination, May 2016

BCA – Fourth Semester

DATA COMMUNICATION AND NETWORKS (BCA-4004)

Time: 3 hrs
Max Marks: 75
No. of pages: 2

Note: Attempt FIVE questions in all; taking at least ONE question from each UNIT. Q.1 is compulsory. All questions carry equal marks.

Q.1 a) The highest data rate is provided by the transmission medium:
   i) Coaxial cable.
   ii) Microwave.
   ii) Optical fiber.
iv) Twisted pairs.

b) In ARQ, a NAK:
   i) Is sent by the recipient if the message contains an error.
   ii) Means that the sender should continue with sending the next message.
   iii) Is sent by the recipient if the message was received without error.
   iv) Is sent by the sender at the same time as it sends a data packet.

c) Cryptography is used for only encoding the messages. (True/False)

d) ________ is designed to use the high bandwidth capability of a fiber optic cable.

e) Half duplex in transmission channel is defined as:
   i) Either party can send data to the other at the same time.
   ii) Either party can send data to the other alternatively.
   iii) Both parties can send and receive data, but not at the same time.
   iv) Only one party can send data to the other.

f) What is the central device in star topology?
   i) STP server. ii) Hub/Switch.
   iii) PDC. iv) Router.

g) A composite signal is ________.

h) TCP/IP model has ________ layers.

i) You need to connect two computers for file sharing. Is it possible to do this without using a hub or router? If yes, how?

j) The slowest transmission speed is of:
   i) Twisted pair wire. ii) Coaxial cable.
   iii) Fiber-optic cable. iv) Microwaves. $1^{1/2} \times 10$

UNIT-I

Q.2 a) What is meant by simplex, half duplex and full duplex communication system? Give an example of each.

b) Explain the various categories of types of computer networks.
Q.3  a) List two ways in which OSI reference model and TCP/IP reference model are same and two in which they differ.  

b) Which of the OSI layers handles each of the following?
   i) Breaking the transmitted bit stream into frames.
   ii) Determining which route to use.
   iii) Encapsulation occurs at this layer.
   iv) Flow control takes place at this layer.
   v) UDP resides at this layers.

c) Differentiate between Ring, Star and Mesh topology.

UNIT-II

Q.4  a) Describe the structure of an optical fiber and explain the process of light propagation along the fiber.

b) Explain the concept of wireless transmission. Also describe radio and microwave transmission.

Q.5  Given a 10-bit sequence 1010011110 and a divisor of 1011, is there any error in the data unit. Calculate the CRC.

UNIT-III

Q.6  CSMA stands for “Carrier Sense Multiple Access” which is standardized in IEEE 802.3. Explain the concept of CSMA along with IEEE 802.3 standard.

Q.7  a) Explain link state routing.

b) Write short notes on:
   i) Bridges.
   ii) Repeaters.

UNIT-IV
Q.8 ‘Cryptography describes the process where information is configured such that it has to be decoded in order to extract valuable data’. Do you agree with the statement? Justify your answer while explaining various kinds of cryptography. 15

Q.9 Write short notes on:
   a) Packet Switching.
   b) Telnet.
   c) DNS. 5x3

End Semester Examination, May 2016

BCA -Fourth Semester

BUSINESS COMMUNICATION AND CONVERSATIONAL SKILLS-II
(BCA-4005 / BCA-406)

Time: 3 hrs

Max Marks: 75

No. of pages: 3

Note: All questions are compulsory. Write the complete sentence with answers.

Q.1 Fill in the gap with comparative forms of the English adverbs given in the brackets:
   a) He went _______ than his friends. (far)
   b) Don is working _______ than greg. (hard)
   c) The reply came _______ than we had expected. (soon)
d) He speaks English much _______ than he did a year ago. (well)
e) Mary sang _______ than the other girls. (well)

Q.2 Write the capital of the following states:

a) Assam b) Gujrat c) Telangana d) West Bengal

e) Uttarakhand f) Bihar g) Haryana

Q.3 Read the passage below and answer the questions that follow:

The role friends play in our lives has become significantly greater than at any other time in our history. Today many of us live and work great distances from where we were born or grew up and are separated from our original families. The pain we feel when we are away from our families can be significant.

The happiness of the individual relies on friendships which form a necessary human connection. It is perfectly normal to need and want friends and depression is more prevalent among those who lack friends. They lack the intimacy and richness friends. They lack the intimacy and richness friends can bring into our lives. Frequently friends reflect similar values to us. Yet these values are often different from the ones we grew up with; they are the values we created for ourselves in our adult lives.

Communications skills are fundamental in all friendships. The more friends and acquaintances one has, the greater are one's communication skills. Some call these, people skills.

Like watering a plant, we grow our friendships (and all our relationships) by nurturing them. Friendships need the same attention as other relationships if they are to continue. These relationships can be delightfully non-judgment, supportive, understanding and fun.
Sometimes a friendship can bring out the positive side that you never show in any other relationship. This may be because the pressure of plying a ‘role’ (daughter, partner or child) is removed. With a friend you are to be yourself and free to change. Of course you are free to do this in all other relationships as well but in friendships you get to have lots of rehearsals and discussion about changes as you experience them. It is an unconditional experience where you receive as much as you give. You can explain yourself to a friend openly without the fear of hurting a family member. How do friendships grow? The answer is simple. By revealing yourself; being attentive; remembering what is most important to your friend and asking them about it; putting yourself in their position; showing empathy; seeing the world through the eyes of your friend, you will understand the value of friendship. All this means learning to accept a person from a completely different family to your own or perhaps someone from a completely different cultural background. This is the way we learn tolerance. In turn we gain tolerance and acceptance for our own differences.

Friendships are made by being considerate which means all the communication skills come into play: active listening skills, questioning skills, negotiation skills, reflecting content skills, reflecting emotion skills, and editing yourself.

vii) Friendships offer a great opportunity to learn about yourself because a friend can reflect back to you ‘how you come across in the world’. They also allow you to practice skills in dealing with ‘personal boundaries’ by looking after yourself as well as your friend. They help you develop resilience in relation to the wider social world beyond your family.

Attempt following questions:

a) i) Why do friends play a more significant role today than ever before? 2

ii) Why is friendship considered an essential human need? 2

iii) How is friendship different from other relationships? 2

iv) Mention two essential human values that help friendship to grow. 1

v) Which communication skills help in building friendship 2
b) Pick out words from the passage which mean the same as each of the following:

i) Basic essential (para 3)

ii) Mutual discussion to reach an agreement (para 6)

iii) Chance (para 7)

Q.4 Write a conversation between you and your father after you got a reappear in one of your favourite subject. (Cover the reasoning given by you and the advice given by your father)

Q.5 Fill up the correct tense:

a) I _______ my exercise because I didn’t understand the question.

   i) Did ii) Won’t do iii) Will do iv) didn’t do

b) He’s not happy because his brother _______ his computer.

   i) Will use ii) Doesn’t use iii) has used iv) using

c) Sam _______ the marathon for the first time in 2009.

   i) Ran ii) is running iii) has run iv) runs

d) Speak up! can’t hear you because your dog _______ too much noise.

   i) Made ii) has made iii) makes iv) is making

e) He often _______ to the cinema because he loves movies.

   i) Going ii) is going iii) goes iv) go

f) They _______ (live) in Ranchi since three years.

g) ________ (foresee) the danger they left the place.
Q.6 How do you handle a customer who has got angry because of poor after sales service of Samsung mobile phone? Write at least 3 dialogues between you and the customer.

Q.7 Explain the meaning of the following business phraseology and frame a sentence of it:
   a) Call a meeting off
   b) Get your priorities right
   c) Scale up
   d) Push my agenda
   e) Embrace every opportunity

Q.8 Find the odd one out with the valid reason:
   a) 396, 462, 572, 427, 671, 264
   b) 16, 25, 36, 72, 144, 196, 225
   c) 41, 43, 47, 53, 61, 71, 73, 81
   d) 331, 482, 551, 263, 383, 362, 284
   e) 835, 734, 642, 751, 853, 981, 532

Q.9 Fill up with “who, how, when”.
   a) Please inform me ________ you are coming back.
   b) It depends on him ________ he manages the affairs.
   c) Please tell me ________ stole my book.

Q.10 Write a paragraph on any one of the following topics in about 100 words:
End Semester Examination, May 2016
MCA - Third Semester
ENTREPRENEURSHIP DEVELOPMENT (MCA-002(CB))

Time: 3 hrs
Max Marks: 100
No. of pages: 1

Note: Attempt FIVE questions in all; Q.1 is compulsory. Attempt any TWO questions from Part A and TWO questions from Part B. Each question carries equal marks.

Q.1 Explain the following briefly:
   a) What are the key traits of an entrepreneur?
   b) What are the main motivation factors for an entrepreneur?
   c) Discuss proprietorship v/s partnership v/s company form of business.
   d) What is meant by ‘Management’ – what are the main functional areas of management?
   e) What is ‘Break Even Analysis’?
f) What are the key elements of a project report for S.S.I. unit?
g) Discuss role of banks towards entrepreneurship development.
h) What is the main criteria for locating a business/ industry unit?
i) What are technical consultancy organizations?
j) “Entrepreneurship is a risk; you win some, loose some” – Give your comments.

2x10

PART-A

Q.2 Define entrepreneurship. What is the difference between a 1\textsuperscript{st} generation and a 2\textsuperscript{nd} generation entrepreneur? How is an entrepreneur different from a manager? 20

Q.3 What is the role of MSMEs towards economic development of India? 20

Q.4 What are the key elements of human resource management within a business organization? Explain. 20

PART-B

Q.5 If you plan to set up a business unit/ company after completing your education, what will be the nature of such business? Write a full business plan for the same. 20

Q.6 What are different methods of evaluating a business project? Give details. 20

Q.7 What is the overall institutional support available in India for setting up business/ industry? Give details of technical and financial support systems available. 20
Q.1 a) To apply for a patent, an inventor must:
   i) File an application at a patent office which must comply with formal and technical requirements.
   ii) Demonstrate that their invention works.
   iii) None of the above.

b) Which of the following is not a type of copyright work?
   i) Literary works
   ii) Furniture
   iii) Musical works
   iv) All of the above
c) In computer security, __________ means that the information in a computer system only be accessible for reading by authorized parties.

i) Confidentiality

ii) Integrity

iii) Availability

d) What is internet?

e) What is full form of FTP?

f) What is full form of www?

g) Define ‘data mining’.

h) Define ‘M-Commerce’.

i) Define ‘virtual campus’.

j) Define ‘copyrighting’.  

**PART-A**

Q.2  a) Describe various social and ethical issues in ICT.  

b) Write a short note on mobile platforms.  

Q.3  Write short notes on the following:

a) Telnet  

b) Search Engine  

c) Internet  

d) E-mail  

Q.4  a) What is the difference between 3G and 4G?  

b) Write a short note on E-commerce.  

b) Write the uses of cloud technology.  

**PART-B**

Q.5  a) What is patent? What are the conditions to be satisfied by an invention to be patentable?  

b) What is cyber crime? Discuss the various categories of cyber crimes.
Q.6  a) Discuss the various applications of ICT in employment.  
     b) Describe the concepts of biometric technology.  

Q.7  a) What are the features of data mining?  
     b) Write a short note on E-banking.

End Semester Examination, May. 2016

MCA - First Semester

DISCRETE STRUCTURES (MCA-102)

Time: 3 hrs

Max Marks: 75

No. of pages: 3

Note: Attempt FIVE questions in all; taking at least ONE question from each Unit. 
Q.1 is compulsory. All questions carry equal marks.

Q.1  a) Let \( f \), \( g : \mathbb{R} \rightarrow \mathbb{R} \) denote functions defined by \( f(x) = 2x + 3 \) and \( g(x) = x^2 \) for every \( x \in \mathbb{R} \). Find \( f \circ g \).

b) Show that the mapping \( f : \mathbb{Z}^+ \rightarrow \mathbb{Z}^+ \) defined by \( f(x) = x^2 \), \( x \in \mathbb{Z}^+ \), where \( \mathbb{Z}^+ \) is the set of integers, is one-one and into mapping.

c) Let \( A = \{1, 2, 3, 4\} \) and \( R = \{(1, 2)(2, 3)(3, 4)(2, 1)\} \). Find the transitive closure of \( R \).

d) Draw the Hasse diagram of \( D_{36} \).

e) If \( H \) is a subgroup of \( G \) then prove that identity element of \( G \) is also the identity element of \( H \).

f) Prove that if \( G \) is abelian group then \( \forall a, b \in G \) and all integers \( n \), \( (ab)^n = a^n b^n \).
g) Draw the complete bipartite graph $K_{3,2}$.

h) Define an acyclic graph with an example.

i) Define finite state automata with an example.

j) Solve the difference equation $a_r - 3a_{r-1} + 2a_{r-2} = 0$.

**UNIT-I**

Q.2 a) Solve the recurrence relation: $a_n - 4a_{n-1} = 6 \cdot 4^n$, $a_0 = 1$.

b) How many people among 2,00,000 people are born at the same time (hour, minute, seconds)?

Q.3 a) Determine whether the following are equivalent, using biconditional statement:

i) $p \iff q = (p \land q) \lor (\sim p \land \sim q)$

ii) $(p \rightarrow q) \rightarrow t = (p \land \sim q) \rightarrow t$

b) Consider the set $A = \{1, 2, 3, 4\}$ and the relation $R = \{(1, 2)(2, 1)(2, 2)(3, 2)(3, 3)(3, 4)(4, 4)\}$ on set $A$. Determine $M_R^2$ from $R$.

**UNIT-II**

Q.4 a) Construct the meet and join table of the lattice $(L, \lor, \land)$. 

![Lattice Diagram]
Q.5  a) Design a circuit that accepts a 3-bit number and gives output 0 if input represents an even decimal number and gives an output 1 if input represents an odd decimal number.

b) Let \( G \) be a group in which \((ab)^i = a^ib^i\) for 3 consecutive integers \( i \) \( \forall a, b \in G \) then prove that \( G \) is abelian.

UNIT-III

Q.6  a) Find a minimum spanning tree of the labeled connected graph below:
b) Find a maximal flow in the network below:

Q.7 Find the shortest path between K and L by using Dijkstra’s Algorithm.
UNIT-IV

Q.8 Let $M_1$ be a Mealy machine whose transition table is given below:

Find equivalent Moore machine $M_2$

Q.9 Construct deterministic finite state automaton equivalent to the following non-deterministic finite state automaton: $M = (\{0,1\}, \{S_0, S_1\}, S_0, \{S_1\}, f)$, where $f$ is given by the table:

\[
\begin{array}{c|c}
   & f \\
\hline
   I & \\
\end{array}
\]

15
End Semester Examination, May 2016
MCA - First Semester

DISCRETE STRUCTURES (MCA-102)

Time: 3 hrs
Max Marks: 75
No. of pages: 3

Note: Attempt FIVE questions in all; taking at least ONE question from each Unit. Q.1 is compulsory. All questions carry equal marks.

Q.1 a) Let $f, g : R \rightarrow R$ denote functions defined by $f(x) = 2x + 3$ and $g(x) = x^2$ for every $x \in R$. Find $f \circ g$.

b) Show that the mapping $f : Z^+ \rightarrow Z^+$ defined by $f(x) = x^2, x \in Z^+$, where $Z^+$ is the set of integers, is one-one and into mapping.

c) Let $A = \{1, 2, 3, 4\}$ and $R = \{(1, 2), (2, 3), (3, 4), (2, 1)\}$. Find the transitive closure of $R$.

d) Draw the Hasse diagram of $D_{36}$.
e) If \( H \) is a subgroup of \( G \) then prove that identity element of \( G \) is also the identity element of \( H \).

f) Prove that if \( G \) is abelian group then \( \forall a, b \in G \) and all integers \( n \), \( (ab)^n = a^n b^n \).

g) Draw the complete bipartite graph \( K_{3,2} \).

h) Define acyclic graph with an example.

i) Define finite state automata with an example.

j) Solve the difference equation
\[
a_r - 3a_{r-1} + 2a_{r-2} = 0.
\]

\[1 \frac{1}{2} \times 10\]

**UNIT-I**

Q.2 a) Solve the recurrence relation:
\[
a_n - 4a_{n-1} = 6 \cdot 4^n, a_0 = 1
\]

b) How many people among 2,000,000 people are born at the same time (hour, minute, seconds)?

6

Q.3 a) Determine whether the following are equivalent, using biconditional statement:

i) \( p \leftrightarrow q \equiv (p \land q) \lor (\neg p \land \neg q) \)

ii) \( (p \rightarrow q) \rightarrow t \equiv (p \land \neg q) \rightarrow t \)

10

b) Consider the set \( A = \{1, 2, 3, 4\} \) and the relation
\[
R = \{(1, 2), (2, 1), (2, 2), (3, 2), (3, 3), (3, 4), (4, 4)\}
\]
on set \( A \). Determine \( M_R \) from \( R \).

5

**UNIT-II**

Q.4 a) Construct the meet and join table of the lattice \( (L, \lor, \land) \).
b) Minimize the four variables logic function using K-map:

\[ f(A, B, C, D) = \sum (0, 1, 2, 3, 5, 7, 8, 9, 11, 14) \]

Q.5 a) Design a circuit that accepts a 3-bit number and gives output 0 if input represents an even decimal number and gives an output 1 if input represents an odd decimal number.

8

b) Let \( G \) be a group in which \((ab) = a'b'\) for 3 consecutive integers \( i \forall a, b \in G \) then prove that \( G \) is abelian.

UNIT-III

Q.6 a) Find a minimum spanning tree of the labeled connected graph below:
b) Find a maximal flow in the network below:

Q.7 Find the shortest path between K and L by using Dijkstra’s Algorithm.
15

UNIT-IV

Q.8 Let $M_1$ be a Mealy machine whose transition table is given below:

<table>
<thead>
<tr>
<th>$S$</th>
<th>$I$</th>
<th>$f$</th>
<th>$g$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0 1</td>
<td>0 1</td>
<td></td>
</tr>
<tr>
<td>$S_0$</td>
<td>$S_3$, $S_1$</td>
<td>0 1</td>
<td></td>
</tr>
<tr>
<td>$S_1$</td>
<td>$S_1$, $S_2$</td>
<td>1 0</td>
<td></td>
</tr>
<tr>
<td>$S_2$</td>
<td>$S_2$, $S_3$</td>
<td>0 0</td>
<td></td>
</tr>
<tr>
<td>$S_3$</td>
<td>$S_3$, $S_0$</td>
<td>0 0</td>
<td></td>
</tr>
</tbody>
</table>

Find equivalent Moore machine $M_2$.

Q.9 Construct deterministic finite state automaton equivalent to the following non-deterministic finite state automaton: $M = (\{0, 1\}, \{S_0, S_1\}, S_0, \{S_1\}, f)$, where $f$ is given by the table:

<table>
<thead>
<tr>
<th>$S$</th>
<th>$I$</th>
<th>$f$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0 1</td>
<td>1 0</td>
</tr>
<tr>
<td>$S_0$</td>
<td>${S_0, S_1}$</td>
<td>${S_1}$</td>
</tr>
<tr>
<td>$S_1$</td>
<td>$\phi$</td>
<td>${S_0, S_1}$</td>
</tr>
</tbody>
</table>
End Semester Examination, May 2016

MCA – First Semester

PROGRAMMING IN ‘C’ (MCA-103(CB))

Time: 3 hrs  Max Marks: 100

No. of pages: 1

Note: Attempt FIVE questions in all; Q.1 is compulsory. Attempt any TWO questions from Part A and TWO questions from Part B. Each question carries equal marks.
Q.1  a) What is a life?  
   b) Differentiate between gets( ) and fgets( )?  
   c) Define pointers.  
   d) Explain the term: 'dynamic memory allocation'.  
   e) Explain the syntax of printf( ) and scanf( ).  
   f) Why are arrays needed?  
   g) Define a function. Why they are needed in a program?  
   h) In which situation a switch case in desirable?  
   i) What is a ternary operator? Give an example.  
   j) What is the advantage of using structures?  

PART-A

Q.2  a) Describe the iterative statements that C language supports in detail.  

   b) What do you understand by scope of a variable? Explain it in detail with suitable examples.  

Q.3  a) Why does storing of sparse matrices need extra consideration? How are sparse matrices stored efficiently in computer’s memory?  

   b) Write a program to interchange the largest and smallest element of the array.  

Q.4  a) Write a program to calculate the parking charges of a vehicle. Read the hours and minutes when the vehicle enters the parking lot. When the vehicle is leaving, enter its leaving time? Calculate the difference between the two timings to calculate the number of hours and minutes for which the vehicle was parked. Finally calculate the charges based on the following rules and then display the result on the screen.

<table>
<thead>
<tr>
<th>Vehicle Name</th>
<th>Rate till 3 hours (in `)</th>
<th>Rate After 3 hours (in `)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Truck/Bus</td>
<td>20</td>
<td>30</td>
</tr>
<tr>
<td>Car</td>
<td>10</td>
<td>20</td>
</tr>
<tr>
<td>Cycle/Motorcycle/scooter</td>
<td>5</td>
<td>10</td>
</tr>
</tbody>
</table>
PART-B

Q.5 Write a menu driven program to perform various string operations using pointers.  

Q.6 a) What do you understand by a union? Differentiate between a union and a structure.  

b) Explain with an example how structures are initialized. How is a structure name different from a structure variable?  

Q.7 Explain the different modes in which a file can be opened in C program and under which circumstances the function fopen( ) fail? What is the impact of fclose( ) on buffered data.  

End Semester Examination, May 2016
MCA – First Semester
COMPUTER NETWORKS (MCA-104(CB))

Time: 3 hrs
Max Marks: 100
No. of pages: 1
Note: Attempt **FIVE** questions in all; **Q.1 is compulsory.** Attempt any **TWO** questions from **Part A** and **TWO** questions from **Part B.** Each question carries equal marks.

**Q.1** Answer the following:

a) Define bluetooth.

b) Name any two applications of networks.

c) Define modes of transmission.

d) Describe the merits of star topology.

e) Explain the difference between internet and intranet.

f) What is cipher-text? Discuss.

g) Name all the layers of OSI reference model.

h) Differentiate between routers and gateways.

i) Write a short note on IP address.

j) Describe briefly multipoint networks.  

**PART-A**

**Q.2**

a) Explain the factors that affect the performance and reliability of a network.  

b) What are the various advantages of distributed processing? Discuss.  

**Q.3**

a) What are the advantages of multipoint connection over a point-to-point connection? Explain.  

b) Explain the following terms:

   i) Internet.

   ii) Intranet.

   iii) Extranet.  

   c) Explain the merits and demerits of mesh topology.  

**Q.4**

a) Explain the following:
i) Peer-to-peer processes.

ii) Interfaces between layers.

iii) Headers and trailers.  

b) How do the layers of the TCP/IP protocol suite correlate to the layers of OSI model?  

PART-B

Q.5 a) What is the function of a router, explain? How does a router decide where an incoming packet should go and also discuss shortest path routing?  

b) Describe an initial routing table for a distance vector routing.

Q.6 Explain the following:  

a) File transfer protocol.

b) Access control.

c) Packet format of IPv6.


Q.7 a) What do you mean by cryptography? Explain substitution cipher and transposition cipher with an example.  

b) Write a short note on data compression.

End Semester Examination, May 2016

MCA -First Semester

DIGITAL DESIGN AND COMPUTER ORGANIZATION  
(MCA-105(CB))

Time: 3 hrs  
Max Marks: 100
No. of pages: 2

Note: Attempt FIVE questions in all; Q.1 is compulsory. Attempt any TWO questions from Part A and TWO questions from Part B. Each question carries equal marks.

Q.1 a) Convert the following octal functions to their decimal equivalents:
   
   i) \( (560)_8 \)
   ii) \( (0.34)_8 \)

b) If a 3-input NOR gate has eight input possibilities how many of those possibilities will result in a high output.
   
   i) 1
   ii) 2
   iii) 7
   iv) 8

c) Evaluate \( A + \overline{B}C \) using the truth table.

d) The storage element for a static RAM is the ________.
   
   i) diode
   ii) resistor
   iii) capacitor
   iv) flip-flop

e) How is a J-K flip-flop made to toggle?
   
   i) \( J=0, K=0 \)
   ii) \( J=1, K=0 \)
   iii) \( J=0, K=1 \)
   iv) \( J=1, K=1 \)

f) How many data select line are required for selecting 8 inputs?
   
   i) 1
   ii) 2
   iii) 3
   iv) 4

g) What is the Boolean expression for the three input AND gate?
   
   i) \( X = A+B+C \)
   ii) \( X = A\overline{B}\overline{C} \)
   iii) \( X = A-B-C \)
   iv) \( X = A\overline{B}\overline{C} \)

h) Which of the following is not a basic Boolean operations?
   
   i) OR
   ii) NOT
   iii) AND
   iv) FOR
i) Which system translate coded character in to a more useful form?

i) encoder ii) display iii) counter iv) decoder

j) The __________ is often referred to as the brain of a computer.

2x10

PART-A

Q.2 a) Reduce the following Boolean expression using K-maps.

i) \( f = (A, B, C, D) = \sum (0,1,2,3,4,5,10,11,15) \)

ii) \( f = (x, y, z, w) = \sum (1,3,4,5,7,9,11,12,13,15) \)

b) Draw a circuit to realize the Boolean function

\[ F(A, B, C) = AB + \overline{AC} \]

5

c) Why NAND and NOR gates are known as universal gates. Explain.

5

Q.3 a) Evaluate the followings:

i) \( 1100_2 \times 101_2 \)

ii) \( 1011_2 + 11_2 \)

iii) \( 100110 / 110_2 \)

iv) \( (456)_{10} = (?)_2 \)

10

b) i) Convert \((359)_{10}\) into it Excess-3 code.

ii) Give the BCD equivalent for the decimal number 509.

5

c) A 7-bit hamming code is received as 0110110. What is its correct code?

5

Q.4 a) Write short notes on:
i) Full adder

ii) Multiplexer

b) Explain the 3 to 8 decoder using logic diagram.

PART-B

Q.5 a) Discuss the working principle of synchronous counter with its block diagram. What is the advantage of synchronous counter over serial counter?

b) Differentiate between S-R and J-K flip flop.

Q.6 a) What is the function of shift register? Explain different types of shift registers.

b) What is instruction cycle? What are the steps performed by the CPU during the instruction cycle?

Q.7 a) Discuss the various types of addressing modes which are usually provided in microprocessors. Give suitable examples.

b) Write a short note on: cache memory.
End Semester Examination, May 2016

MCA -First Semester

DIGITAL DESIGN AND COMPUTER ORGANIZATION (MCA-105)

Time: 3 hrs

Max Marks: 75

No. of pages: 2

Note: Attempt **FIVE** questions in all; **taking at least ONE question** from each Unit. **Q.1 is compulsory.** All questions carry equal marks.
Q.1  **Multiple choice questions:**

a) Base 16 refers to which number system:
   
   i) Binary coded decimal  
   ii) Decimal  
   iii) Octal  
   iv) hexadecimal

b) The number of bits used to store a BCD digit is:
   
   i) 8  
   ii) 4  
   iii) 1  
   iv) 2

c) The basic logic gate whose output is the complement of input is the:
   
   i) OR gate  
   ii) AND gate  
   iii) INVERTER gate  
   iv) Comparator

d) How many address lines are needed to address each memory locations in a 2048X4 memory chip?
   
   i) 10  
   ii) 11  
   iii) 8  
   iv) 12

e) Which method bypasses the CPU for certain types of data transfer?
   
   i) Software interrupts  
   ii) Interrupt driven I/O  
   iii) Polled I/O  
   iv) Direct memory access

f) With interrupt driven I/O, if two or more devices request service at the same time:
   
   i) The device closest to the CPU gets priority  
   ii) The device that is fastest gets priority  
   iii) The device assigned the highest priority is serviced first  
   iv) The system is likely to crash.

g) Interrupts which are initiated by an I/O drive are:
   
   i) Internal  
   ii) External  
   iii) Software above  
   iv) All of the above
h) ______ is the sequence of operation performed by CPU in processing an instruction:
   i) Execute cycle
   ii) Fetch cycle
   iii) Decode
   iv) Instruction cycle

i) In a JK flip-flop the function K=J’ is used to realize:
   i) T flip-flop
   ii) SR flip-flop
   iii) D flip-flop
   iv) M/S flip-flop

j) Which of the following is not a common word length?
   i) 32
   ii) 8
   iii) 16
   iv) 12

UNIT-I

Q.2 a) Simplify the following using K-map. Also draw the circuit diagram using NAND gates:

   a) \[ F(A, B, C, D) = \sum(0, 3, 5, 6, 9, 11, 13, 14, 15) \]
      \[ D(A, B, C, D) = \sum(1, 2, 8) \]
      \[ 7^{1/2} \]

   b) \[ F(w, x, y, z) = \Pi (1, 5, 7, 9, 10, 12, 14) \]
      \[ 7^{1/2} \]

Q.3 Write short notes on:

   a) Excess-3 code
      \[ 7^{1/2} \]

   b) Digital logic gates
      \[ 7^{1/2} \]

UNIT-II

Q.4 What are combinational circuits? Explain the circuit diagram of decodes and multiplexers.
Q.5 Explain any two bipolar logic families.  

UNIT-III

Q.6 What are counters? Explain 4-bit binary counter.  

Q.7 What are flip-flops? How they help in building a sequential circuit? Discuss master-slave flip-flop.  

UNIT-IV

Q.8 Discuss various steps required to execute an instruction with the help of an instruction cycle. 

Q.9 a) Explain the various types of interrupts.  

b) Write a short note on memory hierarchy.
End Semester Examination, May 2016

MCA - Second Semester

HARDWARE AND NETWORK INTERFACES (MCA-201-CB)

Time: 3 hrs
Max Marks: 100
No. of pages: 1

Note: Attempt FIVE questions in all; Q.1 is compulsory. Attempt any TWO questions from Part A and TWO questions from Part B. Each question carries equal marks.

Q.1 a) Explain the different types of motherboards.
b) What is the function of mouse?
c) What is an input port and an output port?
d) How router works?
e) Discuss the issues of network security.

PART-A

Q.2  a) Discuss the components of a motherboard in detail. Write the process of data connection to motherboard and hard disk.

b) Explain the disk management technique. Write the steps of formatting and partitioning the hard disks.

Q.3  a) What do you understand by ‘peripheral’? Explain with example. Discuss the functions of input and output devices.

b) Describe the types of printers and their working in detail.

Q.4  a) What is USB? How can one install and configure the network printer?

b) Discuss the mobile and network processors in detail.

PART-B

Q.5  a) In how many ways a computer network can be setup? Explain.

b) Why there is a need of computer networks? Also explain different types of networks.
Q.6  a) What are the different aspects of setting up a LAN? Discuss the steps involved in configuring the LAN. 

 b) Explain ‘Ethernet’ in detail.

Q.7  a) What do you mean by a firewall? How many types of firewalls exist for a network security? Also explain setting up rules, exception, blacklist and white_list in firewalls.

 b) Explain the following:
 i) Antivirus.
 ii) Network security.

End Semester Examination, May 2016

MCA - Second Semester

PROGRAMMING IN ‘C++’ (MCA-203-CB)

Time: 3 hrs

Max Marks: 100

No. of pages: 2

Note: Attempt FIVE questions in all; Q.1 is compulsory. Attempt any TWO questions from Part A and TWO questions from Part B. Each question carries equal marks.

Q.1  Multiple choice questions:

 a) C++ was originally developed by:
b) What is the purpose of abstract class?

i) to provide help in database connectivity.
ii) to provide data input to other classes.
iii) to provide security to other classes.
iv) to provide an appropriate base class from which other classes will inherit.

c) What is the default visibility mode of members of classes in C++?

i) Private
ii) Public
iii) Protected
iv) Depends

d) Which data type is more memory efficient?

i) Structure
ii) Union
iii) Both use same memory
iv) Depends on a programmer.

e) How can we define member function outside the class?

i) Using union
ii) Using structure
iii) Using pointers
iv) Using resolution

f) The major goal of inheritance in C++ is?

i) To facilitate the reusability of code.
ii) To help in modular programming.
iii) To facilitate the conversion of data types.
iv) To extend the capabilities of a class.

g) A class having no public construction is:
i) A public protected class   ii) A public class
iii) A protected class   iv) A private class

h) C++ is a:
   i) Procedural programming language.
   ii) Structural programming language.
   iii) Low level language.
   iv) Object oriented programming language.

i) Explicit call to a constructor means?
   i) Not providing the constructor name at all.
   ii) The shorthand method.
   iii) Providing the constructor name explicitly to invoke it.
   iv) Providing the constructor name implicitly to invoke it.

j) The objects can directly access:
   i) Public members
   ii) Private members
   iii) Both i) and ii)
   iv) None of the above

k) Explain the following terms:
   i) Encapsulation
   ii) Dynamic binding.

PART-A

Q.2 Explain the basic concepts of object oriented programming.
   20

Q.3 a) What are the advantages of function prototypes in C++?
   10
b) When will you make a function inline? What is the main advantage of passing arguments by reference?

10

Q.4 a) What is a friend function? What are the merits and demerits of using a friend function?

10

b) How is a member function of a class defined?

10

PART-B

Q.5 Can we have more than one constructor in a class? If yes, explain the need for such a situation. Explain the types of constructors with examples.

20

Q.6 What are the different forms of inheritance? Give an example of each.

20

Q.7 a) What is the basic difference between manipulation and IOS member functions in implementation? Give examples.

10

b) What are the advantages and disadvantages of using exception handling mechanism in a program?

10
Q.1  a) Show that \( Z \) w.r.t. + is a group.

b) If \((xy)^2 = x^2y^2 \) \( \forall \) \(x, y \in G\) show that \( G \) is abelian group.
c) Define linear combination over field $F$.

d) Define vector space over the field $F$.

e) Show that the set: $\{(1,1,0), (0,1,1), (1,0,-1), (1,1,1)\}$ is linearly dependent.

f) Define idempotent matrix with an example.

$$A = \begin{bmatrix} 2 & 1 & -1 \\ 0 & 3 & -2 \\ 2 & 4 & -3 \end{bmatrix}$$

g) Find the rank of matrix $A$.

h) Three coins are tossed simultaneously. What is the probability that at least two tails are obtained.

$$1\frac{1}{2}\times 8$$

i) Explain the algorithm of dual simplex method.

UNIT-I

Q.2  a) Show that: $S = \left\{ \begin{bmatrix} 1 & 2 \\ 2 & -2 \end{bmatrix}, \begin{bmatrix} 0 & -1 \\ -1 & 0 \end{bmatrix}, \begin{bmatrix} 0 & 2 \\ 3 & 1 \end{bmatrix}, \begin{bmatrix} 0 & 0 \\ -1 & 2 \end{bmatrix} \right\}$ is a basis for $M_{22}$.

$$7$$

$$A = \begin{bmatrix} 1 & 3 & 4 & 2 \\ 2 & 4 & 6 & 2 \\ -1 & 5 & 4 & 6 \end{bmatrix}$$

b) Find the rank of a matrix $A$.

$$8$$

Q.3  a) Using elementary row transformation, find $A^{-1}$ if

$$A = \begin{bmatrix} 1 & 0 & 2 \\ 2 & -1 & 3 \\ 4 & 1 & 5 \end{bmatrix}$$

$$8$$

b) Show that the system:

$$x + y + z = -3$$

$$3x + y - 2z = -2$$

$$2x + 4y + 7z = 7$$
of linear equations is not consistent.

UNIT-II

Q.4  

a) Find the eigen values and the corresponding eigen vectors of the matrix:

\[
A = \begin{bmatrix}
6 & -2 & 2 \\
-2 & 3 & -1 \\
2 & -1 & 3
\end{bmatrix}
\]

b) Show that the matrix:

\[
A = \begin{bmatrix}
8 & -8 & -2 \\
4 & -3 & -2 \\
3 & -4 & 1
\end{bmatrix}
\]

is diagonalizable.

Hence, find the transforming matrix of the diagonal matrix.

Q.5  

a) Using Cayley-Hamilton theorem, find \(A^{-1}\) given the matrix:

\[
A = \begin{bmatrix}
13 & -3 & 5 \\
0 & 4 & 0 \\
15 & 9 & -7
\end{bmatrix}
\]

b) One of the eigen values of

\[
\begin{bmatrix}
7 & 4 & -4 \\
4 & -8 & -1 \\
4 & -1 & -8
\end{bmatrix}
\]

is \(-9\). Find the other two eigen values.

UNIT-III

Q.6  

a) Calculate the covariance between height and weight of the following five persons:

<table>
<thead>
<tr>
<th>Height (in cm)</th>
<th>150</th>
<th>148</th>
<th>148</th>
<th>152</th>
<th>154</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight (in Kg)</td>
<td>65</td>
<td>64</td>
<td>63</td>
<td>65</td>
<td>67</td>
</tr>
</tbody>
</table>
8

b) Find the equation of the lines of regression based on the following data:

<table>
<thead>
<tr>
<th>X</th>
<th>4</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>4</td>
<td>4</td>
</tr>
</tbody>
</table>

7

Q.7  a) Two fair dices are rolled. Find the probability of getting doubles or the sum of 7.

b) Find the standard deviation for the following discrete distribution:

<table>
<thead>
<tr>
<th>X</th>
<th>8</th>
<th>12</th>
<th>16</th>
<th>20</th>
<th>24</th>
</tr>
</thead>
<tbody>
<tr>
<td>P(X)</td>
<td>1/8</td>
<td>1/6</td>
<td>3/8</td>
<td>1/4</td>
<td>1/12</td>
</tr>
</tbody>
</table>

9

UNIT-IV

Q.8  a) Using corner method, solve the following LPP:

Minimize \( z = 8x_1 + 12x_2 \)

Subjected to the constraints:

\[ 60x_1 + 30x_2 \geq 240 \]

\[ 30x_1 + 60x_2 \geq 300 \]

\[ 30x_1 + 180x_2 \geq 540 \]
and \( x_1, x_2 \geq 0 \)

b) Use the simplex method to solve the problem:

Maximize \( u = 2x + 3y \)

Subjected to:

\[-2x + 3y \leq 2\]

\[3x + 2y \leq 5\]

and \( x, y \geq 0 \)

Q.9 Solve the following unbalanced transportation problem:

<table>
<thead>
<tr>
<th></th>
<th>D_1</th>
<th>D_2</th>
<th>D_3</th>
<th>D_4</th>
<th>Supply</th>
</tr>
</thead>
<tbody>
<tr>
<td>O_1</td>
<td>20</td>
<td>21</td>
<td>16</td>
<td>18</td>
<td>10</td>
</tr>
<tr>
<td>O_2</td>
<td>17</td>
<td>28</td>
<td>14</td>
<td>16</td>
<td>9</td>
</tr>
<tr>
<td>O_3</td>
<td>29</td>
<td>23</td>
<td>19</td>
<td>20</td>
<td>7</td>
</tr>
<tr>
<td>Demand</td>
<td>6</td>
<td>10</td>
<td>4</td>
<td>5</td>
<td>—</td>
</tr>
</tbody>
</table>

End Semester Examination, May 2016

MCA - Second Semester

OPERATING SYSTEM (MCA-204-CB)

Time: 3 hrs

Max Marks: 100
Q.1 Fill in the blanks:

a) The operating system that pays more attention on the meeting of the time limits is called __________.

b) __________ is useful when program does not require user intervention.

c) The innermost layer close to hardware is called __________.

d) In __________ mode machine is executing operating system instructions.

e) A thread is sometimes called as a __________ process.

f) __________ operating system supports single user process and single thread.

g) The __________ decides which jobs or processes are to be admitted to the ready queue.

h) A process is __________ if it can affect or be affected by other processes executing in the system.

i) The situation in which a process is waiting for another waiting process may lead to the system in __________ state.

j) In __________ scheme memory is divided into fixed sized blocks called frames and logical memory is divided into fixed sized blocks called pages.  

k) Define the following:

i) Distributed operating system.

  ii) Hashing.

  2½x2

PART-A

Q.2 a) Explain in detail the layered approach of an operating system.  

  12

b) Justify the statement: “operating system acts as a resource manager”.

  8
Q.3 What are the various types of schedulers? Explain with the help of a suitable example.

20

Q.4 Write short notes on:

a) Interprocess communication.

b) Mutual exclusion requirements.

10x2

PART-B

Q.5 What are the necessary conditions for a deadlock? Consider the following snapshot of a system:

<table>
<thead>
<tr>
<th>Allocation</th>
<th>Max</th>
<th>Available</th>
</tr>
</thead>
<tbody>
<tr>
<td>A B C D</td>
<td>A B C D</td>
<td>A B C D</td>
</tr>
<tr>
<td>P0 0 0 1 2</td>
<td>0 0 1 2</td>
<td>1 5 2 0</td>
</tr>
<tr>
<td>P1 1 0 0 0</td>
<td>1 7 5 0</td>
<td></td>
</tr>
<tr>
<td>P2 1 3 5 4</td>
<td>2 3 5 6</td>
<td></td>
</tr>
<tr>
<td>P3 0 6 3 2</td>
<td>0 6 5 2</td>
<td></td>
</tr>
<tr>
<td>P4 0 0 1 4</td>
<td>0 6 5 6</td>
<td></td>
</tr>
</tbody>
</table>

Answer the following questions using Banker’s algorithm.

a) What is the content of the matrix need?
b) Is the system in a safe state?

20

Q.6 a) Explain the difference between internal and external fragmentation.

10

b) Explain the page replacement algorithm.

10

Q.7 Write short notes on:
a) Distributed v/s centralized operating system.

b) File access and allocation method.

10x2
Q.1  a) Differentiate primary key, candidate key and super key with a suitable example.
    b) Explain ACID properties with an example.
    c) What is weak entity set?
    d) Why there is a need of concurrency control?
    e) How can query processing be different from query optimization?

        4x5

PART-A

Q.2  a) What are problems with traditional file processing system? How they are removed in database system? Explain.

        12

    b) Explain the role of DBA in database.

        8

Q.3  a) How data models help in DBMS? Explain different data models of DBMS with example.

        10

    b) What is meant by ER-diagram? Describe the various attributes and relationship constraints in ER diagram with an example.

        10

Q.4  a) What are DDL and DML commands? Explain with examples.

        10

    b) Consider the relation:

        Project (P-no, P-name, Chief-architect)
Employee (E-no, E-name)
Assigned_to (P-no, E-no)

Using SQL evaluate the following:

i) Obtain details of employee working on project name SYSTEM.

ii) Get details of employee working on both projects P200 and P300.

iii) Find the number of employee who work on all projects.

10

PART-B

Q.5  a) Differentiate between full and partial dependencies. What is transitive and multi-valued dependency? Explain with the help of an example.

7

b) What is normalization of databases? Explain all normal forms with an example.

13

Q.6  a) Why database security is important for an organization? Explain the concept of recovery in brief.

8

b) How processing and optimization of query take place in DBMS? What are distributed databases? How transaction management take place in distributed databases?

12

Q.7  What is concurrency control in DBMS? Why it is needed? What are different concurrency control locking techniques in DBMS?

20
Note: Attempt **FIVE** questions in all; **Q.1 is compulsory.** Attempt any **TWO** questions from **Part A** and **TWO** questions from **Part B.** Each question carries equal marks.

**PART-A**

Q.1 Describe the following in detail:

   a) Object states and properties.
   b) Requirement capture with use case.
   c) Control and object flow.
   d) Generalization and aggregation.
   e) Object creation and destruction.

   4x5

Q.2 Explain the concepts and benefits of using Object Oriented Methodology using a suitable example. Explain Booch Methodology of OOSE in detail.

   20

Q.3 What is UML? Define the building blocks of UML and use case models in detail.

   20

Q.4 Explain the elements of an activity diagram using suitable examples. Also describe the advantages of using activity diagrams.

   20

**PART-B**

Q.5 What are access specifications or visibility modes? Explain the types of access specifications with suitable examples along with their usage.

   20

Q.6 Differentiate between static and dynamic structural view of an object oriented system. Also discuss the state diagram notations and states in detail.

   20
Q.7 Explain the concept and benefits of using sequence diagrams. Draw a sequence diagram for an ATM (Automatic Teller Machine) system.

20
Q.1 Fill in the blanks:

a) The value of Karl Pearson’s coefficient of correlation \((r)\) lies between ______ to ________.

b) Mean of binomial distribution is ________.

c) The most efficient random sampling is ________.

d) In linear programming, objective function and objective constraints are ________.

e) \((H)\) is a sub-group of \((G)\) iff ________.

f) Define an Abelian group.

g) State consistency theorem.

h) What do you mean by Feasible Region in linear programming problems?

i) Find the Eigen values of the following matrix:

\[
A = \begin{bmatrix}
2 & 1 \\
1 & -2
\end{bmatrix}
\]

j) What is level of significance in sampling?

2×10

PART-A

Q.2 a) Let \(G\) be a group and \(a^2 = e\ \forall a \in G\). Prove that \((G)\) is an abelian group. 10

b) Find the inverse of the given matrix:

\[
A = \begin{bmatrix}
1 & 2 & -1 \\
3 & 0 & 2 \\
4 & -2 & 5
\end{bmatrix}
\]

10

Q.3 a) Show that the system:

\[x + y + z = -3\]
3x + y - 2z = -2
2x + 4y + 7z = 7

of linear equations is not consistent.

b) For what values of \((\lambda)\) and \((\mu)\), the system of equations:

\[
x + y + z = 6
x + 2y + 3z = 10
x + 2y + \lambda z = \mu
\]

has i) No solution.

ii) A unique solution.

Q.4 a) Verify Cayley Hamilton theorem for the matrix:

\[
A = \begin{bmatrix}
2 & -1 & 1 \\
-1 & 2 & -1 \\
1 & -1 & 2 \\
\end{bmatrix}
\]

and hence find \(A^{-1}\)

b) Diagonalize the matrix:

\[
A = \begin{bmatrix}
1 & 0 & -1 \\
1 & 2 & 1 \\
2 & 2 & 3 \\
\end{bmatrix}
\]

PART-B

Q.5 a) Find the equation of the lines of regression based, on the following data:

\[
x : \quad 4 \quad 2 \quad 3 \quad 4 \quad 2
y : \quad 2 \quad 3 \quad 2 \quad 4 \quad 4
\]

b) Out of 800 family with 5 children each, how many families would be expected to have:
i) Three boys and two girls.

ii) Two boys and three girls.

Q.6  a) What is sampling? Explain all types of methods for sampling.

b) Two independent samples of sizes (7) and (6) have the following values:

Sample A:  28  30  32  33  33  29  34
Sample B:  29  30  30  24  27  29

Examine whether the samples have been drawn from normal populations having the same variance. (Degree of freedom $F_{0.05}(6, 5) = 4.95$)

Q.7  a) Find the maximum of:

$$z = 4x_1 + 10x_2$$

Subjected to

$$2x_1 + x_2 \leq 50$$

$$2x_1 + 5x_2 \leq 100$$

$$2x_1 + 3x_2 \leq 90$$

and $x_1, x_2 \geq 0$

b) Find initial basic feasible solution of the following transportation problem by Vogel’s Approximation Method:

<table>
<thead>
<tr>
<th>O</th>
<th>D1</th>
<th>D2</th>
<th>D3</th>
<th>D4</th>
<th>Availability</th>
</tr>
</thead>
<tbody>
<tr>
<td>O1</td>
<td>21</td>
<td>16</td>
<td>25</td>
<td>13</td>
<td>11</td>
</tr>
<tr>
<td>O2</td>
<td>17</td>
<td>18</td>
<td>14</td>
<td>23</td>
<td>13</td>
</tr>
<tr>
<td>O3</td>
<td>32</td>
<td>27</td>
<td>18</td>
<td>41</td>
<td>19</td>
</tr>
</tbody>
</table>

Requirement  6  10  12  15  43
Q.1 Multiple choice questions:

a) Which amongst the following is not an advantage of distributed systems?
   i) Reliability
   ii) Incremental growth
   iii) Resource sharing
   iv) None of the above

b) Who is called a supervisor of computer activity?
   i) CPU
   ii) Operating system
   iii) Control unit
   iv) Application program

c) Interval between the time of submission and completion of the job is called:
   i) Waiting time
   ii) Turnaround time
   iii) Throughput
   iv) Response time

d) A scheduler which selects processes from secondary storage device is called:
   i) Short term scheduler
   ii) Long term scheduler
   iii) Medium term scheduler
   iv) Process scheduler

e) Memory utilization factor shall be computed as follows:
   i) Memory in use/allocated memory
   ii) Memory in use/total memory connected
iii) Memory allocated/free existing memory
iv) Memory committed/total memory available

\[ 1\frac{1}{2} \times 5 \]

f) Fill in the blank with the appropriate term:

i) ________ is a non-preemptive scheduling algorithm.

ii) A program in execution is called a ________.

iii) The very high page fault activity is known as ________.

iv) In UNIX, file descriptors are called ________.

v) ________ is a technique that reduces information to a smaller size.

\[ 1\frac{1}{2} \times 5 \]

UNIT-I

Q.2 Explain the layered approach of O.S. Also discuss in detail the concept of KERNEL and SHELL.

15

Q.3 a) Explain the basic features of UNIX as an operating system.

9

b) Differentiate between hard real time and soft real time systems.

6

UNIT-II

Q.4 What is the average turnaround time for the following processes using?

a) FCFS

b) SJF non-preemptive

c) Preemptive SJF

<table>
<thead>
<tr>
<th>Process</th>
<th>Arrival time</th>
<th>Burst time</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1</td>
<td>0.0</td>
<td>8</td>
</tr>
<tr>
<td>P2</td>
<td>0.4</td>
<td>4</td>
</tr>
</tbody>
</table>
Q.5  
   a) What are the properties which a data item should possess to implement a critical section?  
   
   b) What is a process? Discuss various states of a process with the help of a process. State transition diagram.

UNIT-III

Q.6  
   Explain the difference between:
   a) Logical and physical address space.
   b) Internal and external fragmentation.
   c) Paging and segmentation.

Q.7  
   a) For the reference string: 7, 2, 0, 3, 3, 6, 3, 6, 7, 0, 2, 3 show FIFO replacement algorithm. What is the number of page faults?

   b) How is protection affected in segmentation of memory?

UNIT-IV

Q.8  
   Discuss the following with suitable examples:
   a) File attributes.
   b) File operations.
   c) File types.
Q.9 Explain the various directory structures used in operating system for storing files. Give merits and demerits of all directory structures. 

15

End Semester Examination, May 2016

MCA – Third Semester

LOGICAL AND QUANTITATIVE REASONING-I (MCA-302(CB))
Q.1  
a) If in a certain code, LUTE is written as MUTE and FATE is written as GATE, then how will BLUE be written in that code?

b) Complete the series 1, 9, 25, 49, ______, 121.

c) Complete the series 6, 12, 21, ______, 48.

d) Complete the series B2CD, ______ BCD4, B5CD, BC6D.

e) What was the day of week on 15 August, 2015?

f) Nitin ranks 18th in a class of 49 students. What is his rank from the last?

g) Pointing to a photograph of a boy Suresh said. "He is the son of the only son of my mother." How is Suresh related to that boy?

h) If in a code of alphabet AT = 20, BAT = 40, then CAT = ?

i) If ‘<’ mean ‘minus’, ‘>’ means ‘plus, ‘=’ means multiplied by and ‘$’ means divided by then what would be the value of 27>81$9<6.

j) Select the correct answer from answer figure.

Q.2  
a) Complete the series:

i) ELFA, GLHA, ILJA, ______ MLNA.

ii) 3, 10, 101, ______.


iv) A, B, D, G, ______.
b) Two car starts from the opposite places of a main road 150 km apart, first car runs for 25 km and takes a right turn and then run 15 km. It then turns left and then run for another 25 km and then takes the direction back to reach the main road. In the meantime due to minor break down the other care can run only 35 km along the main road. What would be distance between two cars at this point?

c) Acting: Theater : : Gambling : ?

Cricket : BAT : : Hockey : ?

Q.3 a) The sum of ages of 5 children born at interval of 3 year in 50 year? What is the age of youngest child?

b) A is two year older then B who is twice as old as C. If the total of the ages of A, B and C be 27, the how old is B?

c) Ram ranks 18th in class of 49 students. What is his rank from the last?

Q.4 a) Choose the missing term:

i) T, R, P, N, L, ?, ?

a) J, G b) J, H c) K, H d) K, I

ii) ADVENTURE, DVENTURE, DVENTUR, _______ VENTU

a) DVENT b) VENTUR c) DEVNTU 2×2

b) If 1st December is Sunday, then 1st January will be ________.

c) What was the day of week on 15 August, 1947?

PART-B

Q.5 a) Introducing a boy, a girl said. “He is the son of the daughter of the father of my uncle”. How is boy related to the girl?

b) A’s son B is married to C whose sister D is married to E the brother of B. How is D related to A?

c) i) Mango : Fruit : : Potato : ?

a) Root b) Fruit c) Stem d) Flower

ii) Dog : Bark : : Goat :?
Q.6  

a) If ‘+’ means ‘minus’, ‘×’ means ‘divided by’, ‘÷’ means ‘plus’ and ‘–’ means ‘multiplied’ by then what will be the value of expression:

\[ 252 \times 9 - 5 + 32 \div 92. \]

b) If 20 – 10 means 200, 8 ÷ 4 means 12, 6 × 2 means 4 then 100 – 10 × 1000 ÷ 1000 + 10 × 10 = ?

c) If ÷ means ×, × means +, + mean −, − means ÷, find the value of 16 × 3 + 5 – 2 ÷ 4.

Q.7  

a) Select a figure from the amongst the answer figure which will continue the same series as established by the five problem figure.

<table>
<thead>
<tr>
<th>Problem figure</th>
<th>Answer figure</th>
</tr>
</thead>
<tbody>
<tr>
<td>i) Δ □ Δ□ △ △□ △☐</td>
<td>△☐ △☐ × △☐ × △☐ × △☐ × △☐</td>
</tr>
<tr>
<td>i) ← ↑ ← ↓ ←</td>
<td>← ← ↑ ↓</td>
</tr>
</tbody>
</table>

b) Choose the mirror image:

i) WHITE

a) ЄTHW  

b) ЄΙΗW  

c) ЄΤΙΗM  

d) ETIHW

ii) 6

a) g  

b) ñ  

c) e  

d) ñ

---

End Semester Examination, May 2016

MCA – Third Semester

WEB APPLICATION AND E-COMMERCE (MCA-302)
Q.1 a) A homepage is ___________.

b) Bookmarks or favorite fields are primarily used for ___________.

c) ___________ language is used to embed image in a web page.

d) ___________ is a personal journal posted on the web for access by the public.

e) The primary purpose of arraymap( ) function is:
   i) Maps the elements of another array into itself.
   ii) Passes each element of the array and returns the necessary mapped elements.
   iii) Passes each element of the array on which it is invoked to function you specify and return an array containing the values returned by that function.
   iv) None of the above.

f) What term refers to the small webpage that opens automatically with an advertisement when we visit some websites?

g) The method operator used to identify the array is:
   i) array types( )
   ii) = =
   iii) = = =
   iv) typeof

h) What is an ISP?
   i) JavaScript is __________ side scripting language.

j) What does EDI stand for?
   \[1\frac{1}{2}\times10\]

**UNIT-I**

Q.2 Write short notes on:

a) Bulletin board system

b) WWW
c) Telnet and FTP

Q.3  
   a) How frames are created in HTML? Explain with an example.  
   b) Write a short note on Photoshop.  

UNIT-II

Q.4  
   a) Explain on_click and on_load events in detail.  
   b) Explain dynamic HTML.  

Q.5  
   a) Differentiate between external and internal style sheets.  
   b) What are the various formatting styles in CSS?  

UNIT-III

Q.6  
   Explain the following DOM objects:  
   a) Windows Navigator  
   b) History  
   c) Location  

Q.7  
   Explain various data functions, math functions and string functions in JavaScript.  

UNIT-IV

Q.8  
   a) Explain ASP object Model describing various objects in detail.  

Q.9  
   Write short notes on:  
   a) Risks in a payment system  
   b) Digital signatures  
   c) Security issues in e-commerce  

End Semester Examination, May 2016

MCA – Third Semester
Q.1 Fill in the blanks:
   a) HTTP stands for __________.
   b) In PHP, each statement must end with __________.
   c) The CSS property which control text size is __________.
   d) The C in CSS stands for __________.

Multiple choice questions:
   e) Which of the following is not a predefined variable?
      i) $ get)           ii) $ ask  
      iii) $ request       iv) $ point
   f) Mechanism to protect private networks from outside attack is:
      i) Firewall         ii) Formatting 
      iii) Antivirus       iv) Digital signature

Answer the following:
   g) Is this correct syntax to include JS codes inside HTML page?
      <Script type = “Text/JavaScript”>L/Script)
   h) Define home page.
   i) What type of commerce is enabled by technology?
   j) A table can be created without specifying primary key. (True/False)  1½×10
Q.2 Write short notes on:
   a) SMTP
   b) URL
   c) Gopher

   Q.3 a) Create a railway reservation table in HTML using all the attributes of table.
   b) How are the images designed in HTML?

   UNIT-II
   Q.4 Differentiate between internal, external and inline style sheets.

   UNIT-III
   Q.5 a) Create a program in JavaScript using mouse-over function.

   UNIT-IV
   Q.6 Explain ifelse and switch statement in JavaScript using appropriate examples.
   Q.7 Create an admission form in VBScript using different controls.

   End Semester Examination, May 2016
   MCA – Third Semester
   DATA STRUCTURES (MCA-303 (CB))
Q.1  **Multiple choice questions:**

a) The situation when in a linked list START = NULL is ________.
   i) Underflow  ii) Overflow  iii) None of these.

b) The term push and pop is related to:
   i) Stack  ii) Queue  iii) None of these.

c) We can traverse in either direction:
   i) Singly linked list.  ii) Circular linked list.
   iii) Doubly linked list.  iv) None of these.

d) A technique for direct search is:
   i) Binary search.  ii) Linear search.
   iii) Trace search.  iv) Hashing

e) A linear list of elements in which deletion can be done from one end and insertion can take place only at the other end is ________.
   i) Stack  ii) Queue
   iii) Tree  iv) None of these.

**State whether TRUE or FALSE:**

f) LIFO (Last-in First-out) is used in queue.

g) B-trees are generally very deep and narrow.

h) When in-order traversing a tree resulted EACKFHDBG, the preorder traversal would return FEAKDCHBG.

i) The memory address of the first element of an array is called first address.

j) Queue is a non-linear data structure.  

\[1 \times 10\]
**Answer the following:**

k) Define graph.

l) Define binary tree.

m) Define linked list.

n) Define hashing.

o) Define traversing.

**PART-A**

Q.2

a) Suppose A is two-dimensional array with 20 rows and 4 columns. Each element of the array is stored in 4 memory locations. If base address is 500, find the address of A[14, 2] using row-major order and column-major order.

| 10 |

b) Write the Binary Search Algorithm to search a particular element in the list.

| 10 |

Q.3

a) Define a ‘stack’. Discuss the various operations of a stack. Write an algorithm to evaluate the postfix-notation.

| 12 |

b) Explain the drawbacks of linear queue. How these drawbacks can be overcome? Explain with an example.

| 5 |

c) Write a short note on ‘Deque’.

| 3 |

Q.4

a) What are the advantages of linked list? How linked lists can be used for polynomial manipulation? Discuss with a suitable example.

| 10 |

b) Write an algorithm to insert a new element after a given node in a linked list.

| 8 |

c) Give the difference between an Array and a linked list.

| 2 |

**PART-B**

Q.5

What is binary search tree? Write an algorithm to insert a new element in the binary search tree. Construct the binary search tree for the following data:

40, 60, 50, 33, 55, 11. Show each step.

| 20 |

Q.6

Explain various graph traversal techniques in detail. Give the algorithm of each technique with example.

| 20 |
Q.7  
   a) Using linear probing and quadratic probing, insert the following values in a hash 
      table of size 10:
      99, 33, 23, 44, 56, 43, 19
      Also show how many collisions occur in each technique.  
   b) Discuss the various factors affecting choice of file organization.  
   c) Define: Sequential file organization.
Q.1  Fill in the blanks:
   a) There are _________ types of projections.
   b) _________ transformation changes the axes of an object.
   c) Rubber band method include in _________ technique.
   d) Light pen is an_________ device.
   e) LCD stands for _________.
   f) CRT stands for _________.
   g) The image is passed repeatedly to the monitor _________ times in order to maintain a steady picture on the screen.
   h) Scaling means _________ of object.
   i) Mirror reflection gives exact _________ of an object.
   j) A many sided figure termed as _________.

Explain the following in brief:

k) Two Dimensional object.
l) Frame Buffer.
m) Boundary fill Algorithm.
n) Graphical User Interface.
o) Colour Monitor.

PART-A

Q.2  a) Differentiate between CRT and DVST.  
     b) Explain the mechanism to generate the colours in a monitor.

Q.3  a) Explain DDA for line drawing with the help of an example.
b) Explain the following terms in brief:
   
i) Grid.
   
ii) Gravity field.
   
iii) Sketching
   
iv) Dragging
   
v) Inking.  

Q.4  
a) Explain the properties of Bezier Curve in detail.  

b) What is the importance of seed-fill algorithm? Explain it in detail.

PART-B

Q.5  
a) What do you mean by a projection? Explain in detail.

b) What would be new points of a unit cube if it is scaled by twice of its size in x axis; half of its size in z axis and y remain as it is?

Q.6  
a) Explain Cohen Sutherland line clipping algorithm with an example.

b) Explain 2-D viewing pipeline in detail.

Q.7  
a) What do you mean by a hidden surface? How can one detect and remove the hidden surface? Explain.

b) Write an algorithm for back face detection.

End Semester Examination, May 2016

MCA - Third Semester

COMPUTER GRAPHICS AND MULTIMEDIA (MCA-304)
Q.1 Multiple choice questions:

a) The text color in the presentation should contrast with __________ color.
   i) CPU ii) Frame
   iii) Stack iv) Background

b) The process of planning your multimedia presentation is known as:
   i) Design ii) Storyboard layout
   iii) Development iv) None of these

c) The animation can be divided into:
   i) One part ii) Two part
   iii) Three part iv) Four part

d) Z-Buffer algorithm are
   i) Simplest algorithm ii) Complex algorithm
   iii) Largest algorithm iv) None of these

e) The shape of Bezier Curve primarily depends upon the:
   i) Position of control points ii) Distance of control points
   iii) Position of control panel iv) None of these

f) In orthographic projection, engineering use:
   i) Top view of object ii) Front view of object
   iii) Side view of object iv) All of these

g) A pixel may be defined as:
i) Smallest size object ii) Largest size object
iii) Medium size object iv) None of these

h) Some common form of clipping include:
   i) Curve clipping ii) Point clipping
   iii) Polygon clipping iv) All of these

i) A wireless mouse work on:
   i) Infra blue radiation ii) Infra red radiation
   iii) Infra green radiation iv) None of these

j) A graphics tablet works on same principal as:
   i) Light pen ii)
   Monitor
   iii) Projector iv) None of these

1½x10

UNIT-I

Q.2 What are the primary component of CRT? Explain the working of CRT. 15

Q.3 Differentiate following:
   a) Random scan and raster scan.
   b) Zooming and panning.
   c) CUI and GUI. 5x3

UNIT-II

Q.4 a) Find the transformation that scales (w.r.t origin) by:
   i) a units in $x$ direction.
   ii) b units in $y$ direction.
iii) Simultaneously a units in $x$ direction and b units in $y$ direction.

b) What are the conditions to smoothly join curve segment? What is the convex hull property of Bezier curve?

Q.5  
   a) Explain the Cohen Sutherland algorithm for line segment clipping.

   b) Draw a line between $(1, 1)$ and $(7, 5)$ using Bresenhem’s line drawing algorithm.

UNIT-III

Q.6 Derive transformation matrix to scale a unit cube twice uniformly w.r.t. origin. Find the co-ordinates of transformed cube.

UNIT-IV

Q.7 a) Write Z-buffer algorithm for back face removal.

   b) What do you mean by keyframing, tweening and morphing? Explain different applications of animation.

Q.8 a) Explain the minimum hardware requirement for multimedia.

   b) What do you mean by MIDI message? Explain the concept of MIDI hardware in detail.

Q.9 a) What do you mean by compression? Explain in detail.

   b) Explain different types of image formats in detail.
End Semester Examination, May 2016

MCA – Third Semester

COMPUTER SYSTEM ARCHITECTURE (MCA-305(CB))

Time: 3 hrs
Max Marks: 100

No. of pages: 1

Note: Attempt FIVE questions in all; Q.1 is compulsory. Attempt any TWO questions from Part A and TWO questions from Part B. Each question carries equal marks.
Q.1  **Multiple choice questions:**

a) Which registers can interact with the secondary storage?
   i) MAR  
   ii) PC  
   iii) IR  
   iv) RO

b) For a R-S-Flip Flop constructed with NAND gate and input R = 1 and S = 1 the state is:
   i) Memory  
   ii) Set>  
   iii) Reset  
   iv) Unused

c) Which of the following bus is used to transfer data from main memory to peripheral device?
   i) DMA Bus  
   ii) Output Bus  
   iii) Data Bus  
   iv) All of the above.

d) ________ digital circuit perform reverse operation of decoder.
   i) Multiplexes  
   ii) Adder  
   iii) Subtractor  
   iv) Encoder

e) In immediate addressing the operand is placed in:
   i) CPU register  
   ii) After opcode  
   iii) Memory  
   iv) Stack

Answer in brief:

f) Convert \((101011)_2 = (?)_{16}\).

g) What is the benefit of K-map?

h) What is the format of instruction?

i) What is number system?

j) What do you mean by register?

**PART-A**

Q.2  a) Convert:

   i)  \((111011011)_2 = (?)_{16}\).

   ii) \((756.76)_{10} = (?)_8\).

   iii) \((7A.5E)_{16} = (?)_2\).

   iv) \((85.67)_{10} = (?)_{16}\).

   v) \((10110.11)_{2} = (?)_8\).
b) Differentiate between encoder and decoder. Explain with the help of a block diagram.  

Q.3 Explain instruction cycle with the help of an example.  

Q.4 Explain the following:
   a) General register organization.  
   b) Stack organization.  
   c) Input output instruction.  
   d) Memory reference instruction.  

PART-B

Q.5 Differentiate the following:
   a) Memory reference VS I/O reference instruction.  
   b) RISC and CISC  
   c) Isolated VS memory mapped I/O.  
   d) Cache VS virtual memory.  

Q.6 Explain the working of DMA in detail.  

Q.7 a) Explain page replacement with an example.  
   b) Explain booth’s multiplication algorithm with a suitable example.
End Semester Examination, May 2016

MCA – Third Semester

WEB APPLICATION DEVELOPMENT USING PHP (MCA-306(CB))

Time: 3 hrs
Max Marks: 100
No. of pages: 2

Note: Attempt FIVE questions in all; Q.1 is compulsory. Attempt any TWO questions from Part A and TWO questions from Part B. Each question carries equal marks.
Q.1  

a) Which of the following are attributes of font tag?
   
i) Size  
ii) Face  
iii) Colour  
iv) All of the above

b) Which tag is used for arranging the tags in paragraphs?
   
i) <par>  
ii) <paragraph>  
iii) <p>  
iv) <a>

c) Which attribute one will use with TD tag to merge two cells horizontally?
   
i) Merge = colspan2  
ii) Rowspan = 2  
iii) Colspan = 2  
iv) merge = row 2

d) Which CSS property is used to change the text colour of an element?
   
i) Font-Colour  
ii) fg colour  
iii) Text-colour  
iv) Colour

e) PHP is __________ language.
   
i) Sever side  
ii) Client side  
iii) Middle side  
iv) Outside

f) Which of the following is not the scope of variable in PHP?
   
i) Local  
ii) Global  
iii) Static  
iv) External

g) In PHP, variables are case seusetue.
   
i) True  
ii) False

h) In PHP, each statement must be end with
   
i) . (Dot)  
ii) ; (Semicolon)  
iii) / (Slash)  
iv) : (Colon)

i) PHP stands for:
   
i) PHP: Hypertext processor.  
ii) PHP: Hypertext Preprocessor.  
iii) PHP: Hyper Markup Preprocessor.  
iv) PHP: Hyper Markup processor.

j) Which of the following statements prints in PHP?
   
i) Out  
ii) Right  
iii) Echo  
iv) Display

k) It is possible to display pictures in HTML specification by using the tag.
   
i) <GR src = Picture file>
ii) `<Pic src = Picture file>`
iii) `<Img src = Picture file>`
iv) `<GIF src = Picture file>`

l) A webpage is located using a:
   i) Universal Record Linking.
   ii) Uniform Resource Locator.
   iii) Universal Record Locator.
   iv) Uniformly Reachable Links.

m) Write down few features of PHP.

**PART-A**

Q.2  a) How tables are created in HTML? Draw a railway reservation table using all the attributes.  
   10
b) What do you mean by FRAME? How these can be created in webpage?  
   10

Q.3  a) Differentiate ID and class with suitable examples.  
   10
b) Differentiate internal and external style-sheets with suitable examples.  
   10

Q.4  a) What are the various data-types in PHP? Explain using suitable examples.  
   10
b) Explain IF, IF-else and switch statement in PHP through examples.  
   10

**PART-B**

Q.5  a) What are the scopes of variables in PHP? Differentiate in detail using examples.  
   10
b) What are the functions of TRV, CATCH and THROW commands? Explain with examples.  
   10

Q.6  a) Write a program in JavaScript to swap the two images using on mouse over event.  
   10
b) What are various control structures in JavaScript? Explain.  

Q.7  

a) What is MySQL? What are the features of MySQL?  

b) Write the function of use and show command in MySQL.  

c) What are the various joins in MySQL? Explain with examples.
b) What does the block size signify?

c) Write a command in UNIX to search all lines in a life which do not end with a semicolon.

d) Construct a pipeline to list all files beginning with the character ‘p’ on the screen and also store them in a file called ‘file 1’.

e) Display list of last 20 files present in the current directory. Also store this list in a file.

f) Can we change the nice value of a process which is already present in memory?

g) What do you mean by daemon in unix?

h) How can one mail a letter to 5 different users through one command?

i) How will you use positional parameters and special parameters in shell programming?

j) What is the difference between absolute path and relative path?

**PART-A**

Q.2 Describe the meaning of portability. Which security mechanisms are available in UNIX? Also password ageing.

20

Q.3 What is a user mask or file creation mask? What are the system default permissions for newly created files and directories? What is the command to set user mask? Is it possible to have multiple permission sets for a file or directory? Explain your answer.

20

Q.4  a) What do you mean by a filter? Give examples of filters.

8

b) Construct pipelines to carryout following jobs:

i) List all files beginning with the character ‘R’ on the screen twice in succession.

ii) Output of ‘who’ should be sorted and displayed on the screen along with total number of users. The same output except the number of users should also be stored in a file ‘file 1’.

iii) Merge contents of files a.text, b.text and c.text, sort them and display sorted output on the screen page by page.

4x3

**PART-B**

Q.5 A shell script can receive an argument ‘one’, ‘two’ or ‘three’. If the argument supplied is ‘one’ display it is bold, if it is ‘two’ display it in reverse video and if it is ‘three’ make it...
blink on the screen. If a wrong argument is supplied report it. Use an elif or switch statement.

Q.6 What will be output of following program segments?

a)  n = “ask me”
    echo $n
    echo “$n”
    echo ‘$n’

b)  (date; echo hello) > message

c)  Set shadow of Ignorance echo “$*”
    echo “$@”

d)  sortlonglife> file and grap lion longfile> a file and echo $!

Q.7 Discuss the following:

a)  Elementary TCP sockets.

b)  Elementary UDP socket.
End Semester Examination, May 2016

MCA - Fourth Semester

RAPID APPLICATION DEVELOPMENT (MCA-401)

Time: 3 hrs

Max Marks: 75

No. of pages: 1

Note: Attempt FIVE questions in all; taking at least ONE question from each Unit. Q.1 is compulsory. All questions carry equal marks.

Q.1 a) _______ and _________ are data types available in visual basic.

b) _______ and _________ are container controls available in visual basic.

c) The static variables are always declared _________.

d) _______ is an event attached with the textbox in visual basic.

e) A listbox has _______ property.

f) _______ appears on the left side of the screen in visual basic.

g) _______ and _______ are the conditional statements available in visual basic.

h) An array in visual basic is declared as ________.

i) OLE stands for ____________.

j) ________ box provides a set of choices to the user.

UNIT-I

Q.2 Compare and contrast the procedural programming language with an event driven language.

15

Q.3 Explain the following terms:

a) Client area. 5

b) Properties window. 5

c) Code window. 5

UNIT-II

Q.4 a) Explain five important properties of a Textbox in VB. 5

b) Differentiate the following:

i) Listbox and Combobox. 5

ii) Textbox and Label. 5x2
Q.5 Explain the difference between a general procedure and an event procedure with the help of an example.

UNIT-III

Q.6 What is an array? What is the need of an array? Explain the advantages and disadvantages of using an array in VB.

Q.7 Write short notes on:
   a) Operators in VB.
   b) Conditional statements in VB.

UNIT-IV

Q.8 Explain the following terms:
   a) Structured query language (SQL).
   b) Bound data controls.

Q.9 Explain in detail the steps required in creating a data report in VB.
End Semester Examination, May 2016

MCA - Fourth Semester

OBJECT ORIENTED PROGRAMMING IN JAVA (MCA-402(CB))

Time: 3 hrs

Max Marks: 100

No. of pages: 1

Note: Attempt FIVE questions in all; Q.1 is compulsory. Attempt any TWO questions from Part A and TWO questions from Part B. Each question carries equal marks.

Q.1 Describe the following in detail:

a) Java source file structure.

b) Basic features of Java.
PART-A

Q.2 Discuss the usage of JVM in Java. Also explain the basic features and benefits of Java program development environment.

Q.3 Explain the following:
   a) Constructors in Java.
   b) Garbage collection.
   c) Primitives data types in JAVA.
   d) Abstract classes.

Q.4 Explain the following with suitable examples:
   a) Role of constructors in inheritance in Java.
   b) Types of inheritance in JAVA.
   c) Implementing interfaces in JAVA.

PART-B

Q.5 Define usage of packages as access protection in Java. Explain naming conventions and CLASSPATH settings for packages in detail.

Q.6 What is the need of multi-threading programming? Explain the thread life cycle. Discuss the priorities, synchronization and intercommunication of threads in JAVA.
Q.7 Briefly describe the following:

a) Types of JDBC connectivity.

b) JSP scripting and file inclusion.

c) POST and GET requests.

d) Servlet configuration and implementation.
f) The most desirable form of cohesion is __________.
g) A system that does not interact with external environment is called __________
h) For a function of \( n \) variables, boundary value analysis yields __________ test cases.
i) Cause effect graphing is one form of __________.
j) CMM stands for __________.

**PART-A**

Q.2  
**a)** “The software crisis is aggravated by the progress in hardware technology”. Justify your answer by listing various other factors for the software crisis.  

**b)** What is software engineering? Is it an art, craft or science? Discuss.

Q.3  
Assume that size of an organic software product is estimated to be 25,000 LOC. Determine the efforts required to develop software product, development time, average staff size and productivity using basic model of COCOMO.

Q.4  
What is modularity? Explain all types of coupling in detail. What types of problems arise if two modules have high coupling?

**PART-B**

Q.5  
**a)** Testing is an umbrella activity. Justify your answer with a suitable example.

**b)** Draw a neat diagram for testing cycle and also explain its different phases.

Q.6  
A program computes \( a^b \) where \( a \) lies in the range \([1, 10]\) and \( b \) with in \([1, 5]\). Design test cases for these using boundary value analysis and robust testing.

Q.7  
What is software quality? Discuss software quality attributes in detail.
Q.1 a) What are the types of transition networks in natural language processing?

b) What is a Skolem function?

c) Give an example of a heuristic function.

d) What is alpha and beta cut-off in game playing?

e) List Artificial Intelligence task domains. 

**State true or false:**

f) Best first search is a kind of blind search.

 g) Unification is a deduction technique.
h) Neurons are known as simple processors.

i) MYCIN is an expert system, which diagnoses brain diseases.

j) Experimental errors are major sources of uncertainty.

**Fill in the blanks:**

k) A __________ technique improves the efficiency of search process.

l) Mini-max is complete if the tree is __________.

m) Fuzzy logic allows value between __________ and __________.

n) The types of knowledge used in Artificial Intelligence System are __________ and __________.

o) In semantic net, knowledge is represented as __________.

**PART-A**

Q.2 a) Describe the Turing Test and write the criticism it faced. 10

b) Discuss different Artificial Intelligence task domain in detail. 10

Q.3 Consider the following tree:

```
    A
   / \  / \  / \  /
  B   C D   E F   G H
         I   J K   L*
```

Trace the goal L using depth first search technique. 20

Q.4 How will you convert a predicate into clausal form? Discuss all the steps by taking suitable examples. 20

**PART-B**

Q.5 a) What is the difference between non-monotonic reasoning and probabilistic reasoning? 10
b) What is a Bayesian Probabilistic Network? Discuss with example.

Q.6. What are the fundamental problems in using NLP based system? What are the applications of natural language processing?

Q.7
a) What are advantages and disadvantages of neural networks?

b) Draw and discuss basic neuron model.

End Semester Examination, May 2016
MCA - Fourth Semester
ADVANCED DATABASES (MCA-404)

Time: 3 hrs

Max Marks: 75

No. of pages: 2

Note: Attempt FIVE questions in all; taking at least ONE question from each Unit. **Q.1 is compulsory.** All questions carry equal marks.

Q.1 Choose the correct option for the following:

a) The FROM SQL clause is used to:
   i) Specify search condition.
   ii) Specify range for search condition.
   iii) Specify the table we are selecting or deleting data from.

b) Which of the following SQL clause in used to enter data into SQL table?
c) Which of the following SQL clauses is used to select data from two or more tables?
   i) Join
   ii) Having
   iii) Where
   iv) None of the above

d) DML is a language that allows:
   i) To define data
   ii) To define the relationships
   iii) To add new rows
   iv) All of the above

e) Which of the following is a variable attributes?
   i) % rowtype
   ii) % row count
   iii) % count
   iv) None of the above

f) Exception can be declared in the:
   i) Begin
   ii) Declarative
   iii) Anywhere in the PL/SQL block
   iv) None of the above

g) Pragma means the statement runs at:
   i) Runtime
   ii) Compile time
   iii) Both i) and ii)
   iv) None of these

h) Which of the following statement requires an explicit cursor if processing more than one row?
   i) Select
   ii) Update
   iii) Delete
   iv) Insert

i) TCL stands for:
   i) Transaction control language
   ii) Transaction command language
iii) Transaction connect language
iv) None of the above

j) Which command is used to add the views to the database?
   i) Database view
   ii) Create view
   iii) Create option
   iv) None of these

UNIT-I

Q.2  What do you mean by normalization? Explain the anomalies, which are removed through normalization with suitable examples. Define fourth and fifth normal form. Why is 5 NF also called PJNF? Explain.  

15

Q.3  Explain the following:
   a) Armstrong’s inference rules of functional dependency.
   b) E.F. Codd rules of RDBMS.
   c) Features of database management system.  

5x3

UNIT-II

Q.4  Explain the following in SQL:
   a) Various constraints with examples.
   b) Significance of group by clause with examples.
   c) Difference between UNION and Intersection. 

5x3

Q.5  Explain any 10 SQL functions with suitable examples.  

15

UNIT-III

Q.6  What do you mean by cursor? Discuss the usage and working of cursors? Explain with an example.  

15
Q.7 Discuss the following:
   a) Actual and formal parameters.
   b) Syntax for creating a trigger (with an example).
   c) Explicit and implicit exception (with a example).

UNIT-IV

Q.8 What are master detail reports? Explain all types of reports and also write down the steps to create reports.

Q.9 Explain the following:
   a) LOVs
   b) Alerts.
   c) Formulas.
End Semester Examination, May 2016

MCA – Fourth Semester

DATA COMMUNICATION (MCA-405(CB))

Time: 3 hrs Max Marks: 100
No. of pages: 1

Note: Attempt FIVE questions in all; Q.1 is compulsory. Attempt any TWO questions from Part A and TWO questions from Part B. Each question carries equal marks.

Q.1 Answer the following:

a) Expand the equation \( x^6 + x^4 + x^3 + x + 1 \)

b) Define three types of transmission modes.

c) Discuss the merits and demerits of mesh topology.

d) List all the layers of TCP/IP model.

e) What are the responsibilities of session layer? Discuss.

f) Explain the difference between analog signal and digital signal.

   How does NRZ-L differ from NRZ-I? Explain.
h) Name the three major classes of guided media.

i) How does FDM combine multiple signals into one? Explain.

j) Explain how does a single bit error differ from a burst error.

2×10

**PART-A**

Q.2 a) What criterias are required for an effective and efficient network? Discuss the factors that affect the performance of a network. 10

b) Discuss the various components of data communication. Explain the advantages of a multipoint connection over a point-to-point connection. 10

Q.3 a) Assume data stream is made of ten alternating 0s and 1s. Encode this stream using the following encoding schemes.

i) Unipolar  
ii) RZ  
iii) AMI  
iv) Manchester  
v) Differential Manchester 3×5

b) Differentiate between shielded twisted pair and unshielded twisted pair. 5

Q.4 a) List the responsibilities of data link layer and presentation layer. 10

b) Explain the following:

i) Peer-to-peer processes. 3½

ii) Interfaces between layer. 3½

iii) Flow control. 3

**PART-B**

Q.5 a) Discuss the main functions of data link layer and the mechanism of ENQ/ACQ and Poll/select. 15

b) Find the LRC for the following block of data:

10011001 01101111 5

Q.6 a) Given a 6-bit sequence 100100 and a divisor of 1101, find the CRC and if error detection bits are generated, check the received frame for transmission error. 15
b) Explain the difference between TCP and UDP protocol.  

Q.7  

a) Explain the concept of token ring. What will happen if the token is lost? Also explain the frame format of token ring.  

b) Explain the following:  
   i) Frame format of token bus.  
   ii) Congestion control.  

End Semester Examination, May 2016  
MCA - Fourth Semester  
NETWORK SECURITY AND CRYPTOGRAPHY (MCA-405A)  

Time: 3 hrs  
Max Marks: 75  
No. of pages: 1  

Note: Attempt FIVE questions in all; taking at least ONE question from each Unit. Q.1 is compulsory. All questions carry equal marks.  

Q.1  
Answer in one line only:  

a) State the five goals of network security.  

b) What is the full form of virus?  

c) Give one example of network spoofing.  

d) Name three defense models.  

e) Differentiate between active and passive attacks.  

Fill in the blanks:  

f) The two algorithms of primality testing are _________ and _________.
g) Two examples of stream cipher are ________ and ________.

h) PKI stands for ________.

i) Examples of hash function is ________.

j) Three common algebraic structures are ________.

UNIT-I

Q.2 a) What are trojans? Give examples of at least one commonly known trojans.

b) Differentiate between worm and viruses.

UNIT-II

Q.3 Write short notes on the following:

a) Firewalls
b) Data integrity
c) Need for security

UNIT-III

Q.5 How is kerberos designed to provide strong authentication for client/server applications by using secret key cryptography? Also mention the short comings of kerberos.

Q.6 Differentiate between plain text and cipher text. Define various encryption techniques. Explain the traditional methods of data encryption with suitable examples.
Q.7 Discuss the following with suitable examples:

a) Message digests.

b) Hash function.

c) Message integrity and digital signature.

UNIT-IV

Q.8 Find all solutions to each of the following linear equations:

a) \[-4x = 4 \pmod{6}\]

b) \[-9x + 4 = 12 \pmod{7}\]

Q.9 Find value of \(x\) for the following set of congruence using Chinese reminder theorem:

a) \(-x = 2 \pmod{7}\) and \(x = 3 \pmod{9}\)

b) \(-x = 7 \pmod{13}\) and \(x = 11 \pmod{12}\)
Q.1  **Multiple choice questions:**

   a) Amazon web service is which type of cloud computing distribution model?
      i) SaaS                              ii) PaaS
      iii) IaaS                              iv) Cloud on demand

   b) What is private cloud?
      i) A standard cloud service offered via the internet.
      ii) A cloud architecture maintained within an enterprise data centre.
      iii) A cloud service inaccessible to anyone but the cultural elite.
      iv) Cloud servers.

   c) What are the two main sections of a cloud computing system?
i) Terminals and nodes.
ii) Front end and back end.
iii) Networks and servers.
iv) Client and server.

d) Which of the following service provider provides the least amount of built in security?
   i) IaaS
   ii) PaaS
   iii) SaaS
   iv) All of the above

e) “Cloud” in cloud computing represents what?
   i) Wireless
   ii) Hard drives
   iii) People
   iv) Internet

f) Which of these should a company consider before implementing cloud computing technology?
   i) Employee satisfaction
   ii) Potential cost reduction
   iii) Information sensitivity
   iv) All of the above

State whether TRUE or FALSE:

g) Access to a cloud environment always cost more money compared to a traditional desktop environment.

h) Google Docs is a type of cloud computing service:

Fill in the blanks:

i) The two essential concepts of cloud computing are __________ and __________.

j) VIM is a management tool of __________.

PART-A

Q.2  a) What is cloud computing? Explain the various layers of cloud computing with suitable examples? What is the importance of cloud computing for small organizations?  12

b) Explain the following industry platforms related to cloud:
   i) Microsoft Azure.
   ii) Hadoop.
Q.3 What do you understand by grid computing? How is grid different from a cloud? Also differentiate between grid computing and cloud computing by mentioning the advantages and drawbacks of both.  20

Q.4 a) Which is the most common scenario of a private cloud? Explain.  6
   b) Describe the storage architecture implemented in Aneka.  7
   c) Give the detail about the basic approach to a data centre based SOA.  7

PART-B

Q.5 What is the use of onion encryption layer in cloud computing? How is it useful in maintaining trust and reputation in cloud computing? Differentiate between HOM and FPE.  20

Q.6 Write short notes on:
   a) Grid platforms.
   b) Emerging cloud software environments.
   c) Parallel programming paradigms.
   d) Programming on Amazon AWS.  5×4

Q.7 Explain the following in relation to moving applications to clouds:
   a) Cloud bursting.
   b) System abstraction.
   c) Application attributes.
   d) Functionality mapping.  5×4
Q.1 Write full form of:

a) NSS  
b) GSM  
c) ISDN  
d) MMS  
e) PSTN  
f) BSC  
g) PIN  
h) MS  
i) EIR  
j) WI_FI  

PART-A

2x10

Q.2 Explain the GSM architecture with a diagram. Also explain the various GSM entities in detail.

20

Q.3 a) Differentiate between adhoc and infrastructure based wireless network.

10
b) “We cannot live without our mobiles in today’s era.” Justify this statement by giving relevant examples in context to entertainment, communication and usefulness for day to day activities.

10

Q.4 a) Explain the working of virtual private network (VPN).

10

b) Explain the concept and usefulness of WAP push architecture.

10

PART-B

Q.5 Write short notes on:

a) Security issues in adhoc networks.

b) Five applications of adhoc networks.

c) Bluetooth security.

d) Mobile IP goals.

5x4

Q.6 a) What are routing protocols? Write the design issues and goals of routing protocols in detail.

10

b) Explain dynamic state routing (DSR) in detail.

10

Q.7 Write short notes on:

a) Registration.

b) Tunneling.

c) Optimization.

d) Reverse tunneling.

5xEnd
Q.1 a) O-notation provides an asymptotic:
   i) Upper bound    ii) Lower bound
   iii) Light bound   iv) None of these

b) The complexity of selection sort algorithms:
   i) O(n)          ii) O(loge) 
   iii) O(n^2)      iv) O(n)

c) When data are to be deleted from a data structure, but there is no data available, this situation is called?
i) Underflow
ii) Overflow
iii) Houseful
iv) Saturated

d) _______ is a top down approach for solving problem:
i) Divide and conquer
ii) Backtracking
iii) Dynamic programming
iv) Divide

e) The running time of quick sort depends on:
i) Number of inputs
ii) Arrangement of elements
iii) Size of elements
iv) Pivot elements

f) Case does not exist in complexity theory is ________.
g) Greedy method use ________ optimization.
h) ________ approach is used to get optimal solution of travelling sale problem.
i) What are two methods to get minimum spanning tree?
j) Coloring of vertices of graphs using finest possible number of color is called ________ coloring.

UNIT-I

Q.2  a) Differentiate between linear and binary search and explain which one is better and why?
b) Drive the complexity of binary search.

Q.3  Solve the list using merge sort:
15 9 17 25 12 3
Also analyze the complexity of merge sort using recurrence relation. Write the algorithm for the same.

**UNIT-II**

Q.4 Solve the job sequencing with deadline for the given data. Also write algorithm for the same:

<table>
<thead>
<tr>
<th>Profit</th>
<th>20</th>
<th>15</th>
<th>10</th>
<th>5</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deadline</td>
<td>2</td>
<td>4</td>
<td>1</td>
<td>3</td>
<td>3</td>
</tr>
</tbody>
</table>

Q.5 Find MST for given graph using Prim’s method. Also write algorithm for same.
UNIT-III

Q.6 Solve the travelling salesman problem with given cost matrix:

\[
\begin{bmatrix}
\infty & 7 & 3 & 12 & 9 \\
3 & \infty & 6 & 14 & 9 \\
5 & 8 & \infty & 6 & 18 \\
9 & 3 & 5 & \infty & 11 \\
18 & 14 & 9 & 8 & \infty \\
\end{bmatrix}
\]

Q.7 What do you mean by graph coloring? What is 4-phanar graph problem? Write algorithm for graph coloring and also explain it with the help of an example.

UNIT-IV

Q.8 State and prove Cook's theorem.

Q.9 Explain the following:
   a) P class.
   b) NP class.
   c) NP hard.
   d) NP complete.
   e) NP scheduling.
Q.1 Fill in the blanks:
   
a) Data mining is also known as ________.

b) The first step in the process of knowledge discovery from data is ________.

c) Classification is ________ learning.

d) ________ is the famous algorithm for classification.

e) ________ and ________ determine the importance of Association Rule.

f) MOLAP stands for ________.

g) Web mining is used to ________.

h) Binning is used to ________.

i) OLTP stands for ________.

j) Spatial data determines ________.

$1\frac{1}{2} \times 10$

UNIT-I
Q.2 Differentiate between the following:
   a) Data mining and Data warehouse.
   b) ROLAP and MOLAP.

Q.3 Write short notes on the following:
   a) OLAP
   b) Need of data mining.

UNIT-II
Q.4 a) What is an outlier? Explain the ways of removing outliers from data in detail.
   b) Explain with the help of an example the need of normalization.

Q.5 Explain the various ways of mining the data.

UNIT-III
Q.6 What is the need of clustering the data? Explain the partition based method of clustering the data.

UNIT-IV
Q.7 a) What is classification? Why classification is termed as supervised learning?
   b) Explain the need of classification using an example.

Q.8 Write short notes on:
a) Web mining.  

b) Histogram analysis.  

c) Application of data mining in healthcare.  

Q.9 Explain the need of text mining using an example.
Q.1 a) A World Wide Web contains web pages:
   i) Residing in many computers.
   ii) Created using HTML.
   iii) With links to other web pages.

b) The variables of PHP states with ___________.

c) Is JavaScript case sensitive or not?

d) Name the property to change the colour of text in CSS.

e) Which attribute will give the border in the table?

f) `<I> .......... <I>` indicates:
   i) Insert  
   ii) Italics
   iii) Indent  
   iv) Increase font

g) The tag used in HTML to link it with other URL’s is:
   i) `<A>`  
   ii) `<H>`
   iii) `<U>`  
   iv) `<L>`

h) Which tag is used for arranging tags in paragraphs?
Which of the following is not scripting language?

i) HTML

ii) XML

iii) Postscript

iv) JavaScript

What must you know in order to get a website?

i) Its URL

ii) Its Header

iii) Its Title

iv) Name of its webmaster

UNIT-I

Q.2 a) What are the factors to keep in mind while designing a website for a client? 10

b) Differentiate between external and internal links. 5

Q.3 Design a registration form in HTML that shows personal details, area of interest, year of passing, marks of various subjects and total marks as result. 15

UNIT-II

Q.4 a) Write advantages and disadvantages of PHP. 5

b) What is an array? Explain their types with examples. 10

Q.5 a) What do you mean by expression? Explain Boolean, Arithmetic and Relational expressions. 10

b) Differentiate between echo( ) and Print( ) function. 5

UNIT-III

Q.6 a) Define PHP class and object. What are the benefits of creating objects? 10

b) What is $this variable? How is it used? 5

Q.7 What is deconstructor? How do we define deconstructor? Write a program to demonstrate the concept. 15
Q.8  
a) Write a short note on MySQL.  
b) What are DCL statements? What are various DCL statements available in MySQL?

Q.9  
What is a join? What are different types of joins available in MySQL? Explain with examples.
**End Semester Examination, May 2016**

**MCA – Third Semester**

**COMPUTER SYSTEM ARCHITECTURE (MCA-3004)**

Time: 3 hrs  
Max Marks: **75**

No. of pages: 2

Note: Attempt **FIVE** questions in all; **taking at least ONE question** from each **UNIT**.  
**Q.1 is compulsory**. All questions carry equal marks.

**Q.1** Multiple choice questions:

a) One byte equals to how many bits?
   - i) 4
   - ii) 8
   - iii) 12
   - iv) 16

b) I/O processor has direct access to:
   - i) Main memory
   - ii) Secondary memory
   - iii) Flash Memory
   - iv) ROM

c) Which among the following is an important data transfer technique?
   - i) CAD
   - ii) CAM
   - iii) DMA
   - iv) MMA

d) User program interact with I/O devices through:
   - i) Operating system
   - ii) Hardware
   - iii) Buses
   - iv) None of the above

e) During the execution of program which gets initiatives.
   - i) MDR
   - ii) IR
   - iii) PC
   - iv) MAR

f) _________ is used to store data in registers.
   - i) D flip-flop
   - ii) JK flip-flop
   - iii) RS flip-flop
   - iv) None of the above

   g) Which register is used to store the flag?
   - i) Flag
   - ii) Status
   - iii) Test
   - iv) Log
h) __________ format is usually used to store data.
   i) BCD  ii) Decimal  iii) Hexadecimal  iv) Octal
i) The 8-bit encoding format used to store data is:
   i) ASCII  ii) EBCDIC  iii) ANCI  iv) USCII
j) Which memory device is made of semiconductors?
   i) RAM  ii) Hard-disk  iii) Floppy disk  iv) CD 1½×10

UNIT-I

Q.2   a) What is the purpose of Binary Number System? Justify your answer. 5
   b) Explain all the logic gates in detail. 10

Q.3   Simplify the following functions using K-Map.
   a) \( F(A, B, C, D) = \Sigma (2, 3, 6, 7, 9, 11, 12, 13, 14, 15) \)
   b) \( F(A, B, C) = \Sigma (0, 1, 2, 4, 5, 6) \)
   c) \( F = \Sigma \overline{B}C\overline{D} + BCD + ABCD + \varphi(B\overline{C}D + \overline{A}B\overline{C}D) \)

UNIT-II

Q.4   a) What are various types of instructions? Explain with the help of an example. 10
   b) What do you mean by input output interrupt. 5

Q.5   Write short notes on:
   a) General register organization.
   b) Stack organization.
   c) Addressing Modes. 5×3

UNIT-III

Q.6   Differentiate between following:
a) I/O vs memory bus.

b) Isolated vs memory mapped I/O.

c) Asynchronous vs synchronous data transfer.  

Q.7 Explain booth multiplication algorithm with the help of an example.  

UNIT-IV

Q.8 Explain the following:

a) Cache memory.

b) Virtual memory.

c) Page replacement.  

Q.9 What do you mean by parallel processing? Explain pipeline process in detail.  

End Semester Examination, May 2016
LINEAR ALGEBRA AND STATISTICAL TECHNIQUES (MCA-3005)

Q.1 a) Every finite integral domain is a ________.

b) Linear transformation is the rotation of coordinates about the ________.

c) If a matrix A is orthogonal, then ________ is also orthogonal.

d) Normal distribution is a ________ distribution.

e) A solution of an linear programming problems means ________.

f) Find the rank of the matrix:

\[
A = \begin{bmatrix}
3 & 2 & -1 \\
4 & 2 & 6 \\
7 & 4 & 5
\end{bmatrix}
\]

g) What do you mean by correlation between two variables?

h) State consistency theorem.

i) A fair coin is tossed four times. Find the probability that they are all heads if first two tosses results in head.

j) Explain level of significance.  \[1\frac{1}{2} \times 10\]

UNIT-I

Q.2 a) Using consistency theorem, solve the following equation:

\[
\begin{align*}
x + y + z &= 9 \\
2x + 5y + 7z &= 52 \\
2x + y - z &= 0
\end{align*}
\]
b) Find the value of \((\lambda)\) and \((\mu)\) for which the system of equations:

\[
\begin{align*}
3x + 2y + z &= 6 \\
3x + 4y + 3z &= 14 \\
6x + 10y + \lambda z &= \mu
\end{align*}
\]

Has

i) Unique solution

ii) No solution

Q.3

a) Find a basis for the subspace of \(P_2\) spanned by the vectors:

\[
1 + x, x^2, -2 + 2x^2, -3x
\]

b) Find a standard basis vector that can be added to the set:

\[
S = \{(-1, 2, 3), (1, -2, -2)\}
\]

to produce a basis of \(R^3\).

UNIT-II

Q.4

a) Show that the matrix

\[
A = \begin{bmatrix}
8 & -8 & -2 \\
4 & -3 & -2 \\
3 & -4 & 1
\end{bmatrix}
\]

is diagonalizable. Hence find the transforming matrix and the diagonal matrix.

b) Find the characteristic vectors of the matrix:

\[
A = \begin{bmatrix}
3 & 1 & 0 \\
0 & 3 & 1 \\
0 & 0 & 3
\end{bmatrix}
\]

Q.5

a) Verify Cayley Hamilton theorem for the matrix:
\[ A = \begin{bmatrix} 2 & -1 & 1 \\ -1 & 2 & -1 \\ 1 & -1 & 2 \end{bmatrix} \]

and hence find \( A^{-1} \)

b) Show that the matrix.

\[ A = \begin{bmatrix} 2 & 3 & 4 \\ 0 & 2 & -1 \\ 0 & 0 & 1 \end{bmatrix} \]

is not similar to diagonal matrix.

**UNIT-III**

Q.6  

a) Find the equation of the lines of regression based on the following data:

\[
\begin{array}{cccccc}
\text{x} & : & 4 & 2 & 3 & 4 \\
\text{y} & : & 2 & 3 & 2 & 4 \\
\end{array}
\]

b) Calculate the covariance and the coefficient of correlation between \( x \) and \( y \) if

\[
n = 10, \ \Sigma x = 60, \ \Sigma y = 60, \ \Sigma x^2 = 400, \ \Sigma y^2 = 580 \text{ and } \Sigma xy = 305'
\]

**Q.7**  

a) The mean height of 500 students is 151 cm and the standard deviation is 15 cm. Assuming that the heights are normally distributed, find the number of students whose heights lie between 120 cm and 155 cm.

b) The following data shows the number of seeds germinating out of (10) on damp filter for (80) sets of seeds. Fit a binomial distribution to this data:

\[
\begin{array}{ccccccccccc}
x & : & 0 & 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 & 9 & 10 \\
f & : & 6 & 20 & 28 & 12 & 8 & 6 & 0 & 0 & 0 & 0 & 0 \\
\end{array}
\]

**UNIT-IV**

Q.8  

a) Use simplex method to solve the following linear programming problems:

Maximize \( z = x_1 + x_2 + 3x_3 \)
Subject to the constraints

\[3x_1 + 2x_2 + x_3 \leq 3\]
\[2x_1 + x_2 + 2x_3 \leq 2\]

and \(x_1, x_2, x_3 \geq 0\)

b) Discuss the steps to formulate the linear programming problems.

Q.9

a) Using graphical method, find the maximum value of \(z = 2x + 3y\) subject to the constraints.

\[x + y \leq 30\]
\[y \geq 3\]
\[0 \leq y \leq 12\]
\[0 \leq x \leq 20\]
\[x \cdot y \geq 0\]
\[x, y \geq 0\]

b) Discuss the standard form of linear programming problems.

End Semester Examination, May 2016
Q.1  **State whether TRUE or FALSE:**

a) A private variable can only be accessed from within the class.

b) True is a keyword in Java.

c) We can use keywords as variable names.

d) Classes can only be public.

e) Only one constructor can be declared in a class.

f) AWT stands for abstract window toolkit.

g) We can create any number of classes in a single java file.

h) String is a class in Java.

i) Object class is the parent of all classes.

j) A static variable can only be accessed from a static function.

\[ 1\frac{1}{2} \times 10 \]

**UNIT-I**

Q.2  **Write short notes on:**

a) Private and public.

b) Do-while.
c) Arrays.  

Q.3  
  a) Explain garbage collection in detail.  
  b) What is the difference between strings in Java and strings in C?  

UNIT-II  

Q.4  
  a) What is concurrency? How is concurrency controlled in Java?  
  b) Demonstrate the concept of multiple inheritance in Java using a simple program.  

UNIT-III  

Q.5  
  Write short notes on:  
  a) Interface  
  b) Deadlock  
  c) Final  

Q.6  
  a) What is AWT? What is the importance of AWT in creating application?  
  b) Explain any three controls of AWT using suitable examples.  

Q.7  
  Write short notes on:  
  a) Init  
  b) try-catch  
  c) Event handling  

UNIT-IV  

Q.8  
  Write short notes on:
Q.9  

a) What is Servlet? Explain the importance of Servlet in J2EE.  

8

b) Write a short note on JSP. 

7
Q.1 **Fill in the blanks:**

a) __________ involves the integration of software and hardware.

b) __________ is the oldest and most widely used paradigm for software engineering.

c) Software engineering occurs as a consequence of a process called __________.

d) __________ is a software engineering task that bridges the gap between system level software allocation and software design.

e) __________ is a modular building block for computer software.

f) __________ is a black box testing method.

g) Function oriented metrics were first proposed by __________.

**State whether the following statements are TRUE or FALSE:**

h) A process model for software engineering is chosen based on the nature of the project.

i) Data design defines the relationship among major structural elements of the program.

j) In tabular design notation a decision table is divided into two quadrants.
b) Agile methodology.
c) Requirements gathering.  

**UNIT-II**

Q.4 Describe the metric for the design model of a product. What are the attributes of effective software metrics?  

Q.5 a) State and explain various requirement engineering tasks in detail.  
b) Describe the different views of system engineering hierarchy.  

**UNIT-III**

Q.6 a) Explain the features of scenario based testing.  
b) Discuss ‘Regression Testing’ and its importance.  

Q.7 Explain the following:  
a) Cause-effect graphing.  
b) Models for software testing.  
c) Testing principles.  

**UNIT-IV**

Q.8 Explain in detail the highlights of capability maturity model of SEI process.  

Q.9 Differentiate between the following:  
a) Alpha testing and Beta Testing.  
b) Software Quality Control and Software Quality Assurance.  
c) Load testing and stress testing.  

**End Semester Examination, May 2016**  
MCA - Fourth Semester  
**ARTIFICIAL INTELLIGENCE (MCA-4003)**
Q.1 Multiple choice questions:

a) In AI, representation of __________ is a combination of data structures and interpretive procedures that is used in the right way in a program.
   i) Knowledge  ii) Power  
   iii) Strength  iv) Intelligence

b) The turing machine showed that we can use a/an __________ system to program any algorithmic task.
   i) Binary  ii) Electromechanical
   iii) Recursive  iv) Semantic

c) What is the term used for describing the judgmental or commonsense part of problem solving?
   i) Heuristic  ii) Critical
   iii) Value based  iv) Analytical

d) A* algorithm is based on:
   i) Breadth-first search  ii) Depth-first search
   iii) Best-first search  iv) Hill climbing
e) How is Fuzzy logic different from conventional control methods?
   i) IF and THEN approach       ii) FOR approach
   iii) WHITE approach
   iv) ELSE - IF approach

f) A perceptron is:
   i) Fee-forward neural network   ii) Back-propagation algorithm
   iii) Back-tracking algorithm    iv) Feed forward-backward algorithm

h) In Baye's theorem, what is meant by \( P(H_i | E) \)?
   i) The probability that hypothesis \( H_i \) is true given evidence \( E \).
   ii) The probability that hypothesis \( H_i \) is false given evidence \( E \).
   iii) The probability that hypothesis \( H_i \) is true given false evidence \( E \).
   iv) The probability that hypothesis \( H_i \) is false given false evidence \( E \).

i) Machine learning is:
   i) The autonomous acquisition of knowledge through the use of computer programs.
   ii) The autonomous acquisition of knowledge through the use of manual programs.
   iii) The selective acquisition of knowledge through the use of computer programs.
   iv) The selective acquisition of knowledge through the use of manual programs.

j) Which is also called single inference rule?
   i) Reference
   ii) Resolution
iii) Reform the above. iv) None

UNIT-I

Q.2 a) Determine whether goal-driven or data-driven search would be preferable for solving each of the following problems. Justify your answer:

i) Diagnosing mechanical problems in an automobile.

ii) You’ve met a person who claims to be your distant cousin with a common ancestor Rani. You would like to verify her claim.

b) What are the problems encountered in hill climbing? Discuss.

Q.3 Define heuristic search technique. Explain best first search algorithm with an example. How heuristic search technique is better than any other search technique?

UNIT-II

Q.4 Explain the following with examples:

a) Semantic Networks.

b) Frames.

c) Scripts.

Q.5 a) Represent the following sentences in predicate logic form:

i) All women who like ice-creams like chocolates.

ii) The best movie in Hollywood is always better than the best movie in Bollywood.

iii) Some people like eating outside all the time and some people like eating at home all the time.

iv) John likes all kinds of food.
v) All the children likes sweets.  

b) Differentiate predicate and propositional logic.  
c) Define resolution and name its types.  

UNIT-III  

Q.6  
a) Compare and contrast the programming languages of AI.  
b) Elucidate the various passing techniques.  

UNIT-IV  

Q.7  
a) Draw the architecture of an expert system. What are the characteristics of an expert system?  
b) Define NLP and throw a light on its principles.  

Q.8  
State the Baye’s theorem. How is it useful for decision making under uncertainly.  

Q.9  
Write short notes on:  
a) Fuzzy set.  
b) Neural network.  
c) Perception.  

End Semester Examination, May 2016  

MCA - Fourth Semester
Q.1 Multiple choice questions:

a) As frequency increases, the period ___________.

   i) Decreases  
   ii) Increases
   iii) Remains same  
   iv) None of the above

b) The inner core of an optical fiber is ________ in composition.

   i) Glass  
   ii) Fused silica
   iii) Wood  
   iv) None of the above

c) Synchronous transmission does not have ________.

   i) A start bit  
   ii) A stop bit
   iii) Gap between bytes  
   iv) All of the above.

d) ________is the protocol suite for the current internet.

   i) TCP/IP  
   ii) NCP
   iii) UNIX  
   iv) ACM
e) ______ control refers to methods of error detection and correction.
   i) Flow  
   ii) Error  
   iii) Transmission  
   iv) None  
   of the above

**Fill in the blanks:**

f) Full form of VIRUS is ________.

g) The equation for additive inverse is ________.

h) Three common algebraic structures are ________.

i) DES is used in ________ key encryption.

j) PKI stands for __________.

**UNIT-I**

Q.2 What is switching? What are the various types of switching? Differentiate between circuit switching and packet switching with a suitable example.

15

Q.3 Differentiate between the following:

a) Synchronous and Asynchronous transmission.

b) Analog and Digital signals.

c) Bus and Ring topology.

5x3

**UNIT-II**

Q.4 A receiver receives a code 11001100111. When it uses the hamming encoding algorithm, the result is 0101. Which bit is in error? What is the correct code?

15

Q.5 Explain the various frames of HDLC. How do we differentiate various frames of HDLC through their control bit? Also explain the concept of bit stuffing in HDLC by giving
suitable examples.

UNIT-III

Q.6 a) What are the three D's of security? Explain each ‘D’ with a suitable example.

b) Explain various defense models in relation to network security.

Q.7 Find all solutions to each of the following linear equations:

i) \(4x = 4 \pmod{6}\)

ii) \(9x + 4 = 12 \pmod{7}\)

UNIT-IV

Q.8 Compare the digital signature and conventional signature with respect to the following four parameters:

a) Inclusion.

b) Verification.

c) Relation.

d) Duplicity.

Q.9 What is biometrics and biometrics authentication? Why is there a need to take multiple samples during the user registration process of biometrics? Give suitable examples.

End Semester Examination, May 2016

MCA – Fourth Semester

CLOUD COMPUTING (MCA-4007-A)
Q.1 Answer the following questions in one word or in one line only.
   a) What is a private cloud?
   b) What is cloud busting?
   c) Explain micro-blogs.
   d) What are top 3 cloud providers in the market?
   e) What are the services of cloud computing?
   f) Discuss distributed computing.
   g) What are top technologies for cloud computing?
   h) Write one advantage and disadvantage of using cloud computing.
   i) Discuss one big challenge in cloud computing.
   j) What is best definition of cloud computing?  \(1\frac{1}{2} \times 10\)

**UNIT-I**

Q.2 What is cloud computing? Write down the different features of cloud computing in detail. 15

Q.3 Discuss the different challenges of cloud computing while implementing it in any organization. 15

**UNIT-II**

Q.4 Explain the architecture of cloud computing. What are the different characteristics of the best architecture? 15

Q.5 Explain the difference between public, private and communication cloud. 15
UNIT-III

Q.6 Explain the different services provided in cloud computing. How platform as a service (PaaS) is more powerful than any other service?  

Q.7 Discuss the infrastructure as a service (IaaS) of any organization in context to cloud computing and its implementation.  

UNIT-IV

Q.8 What are the different administrative tools used in cloud computing? Explain all in detail.  

Q.9 How cloud storage is more in demand in the education sector now-a-days? Explain your answer with the help of any real life example.  

End Semester Examination, May 2016

MCA - Fifth Semester
Note: Attempt **FIVE** questions in all; **taking at least ONE question** from each Unit. **Q.1 is compulsory.** All questions carry equal marks.

**Q.1 State whether the following statements are TRUE or FALSE:**

a) Garbage collector can be forcefully called by using system gc():

b) Reference type variables cannot be declared as local.

c) Access modifier internal is for usage within the assembly.

d) A function must always have a return type.

e) There are no destructors in C#.

f) Outer class can never be private.

g) ADO.NET supports connection to sql server only.

h) ‘This’ keyword can be used within a static method.

i) You need IIS to run ASP.NET application.

**Answer the question:**

j) JIT stands for:

   i) Just in time

   ii) Just interpretation technique

   iii) Justified in time

   iv) None of the above

\[1\frac{1}{2} \times 10\]

**UNIT-I**
Q.2  
   a) Explain the .NET architecture in detail.  
   b) What is the importance of garbage collection?  

Q.3  
   Write short notes on the following:  
   a) CTS  
   b) Name space  
   c) IL  
   d) Value type and ref type  

   UNIT-II  

Q.4  
   a) Differentiate between C# and C++.  
   b) What is a function in C#? How is it defined?  

Q.5  
   Explain the concept of inheritance. What are different types of inheritance in C#? What are the problems associated with multiple inheritance?  

   UNIT-III  

Q.6  
   Write short notes on:  
   a) ADO  
   b) XML  
   c) Dataset  

Q.7  
   Write a program to connect to SQL server and execute a SQL select query and bind the data with a grid view component.
UNIT-IV

Q.8 Write short notes on:
   a) Web forms.
   b) Web services.
   c) Master page.

Q.9 a) Differentiate between GET and POST method.
   b) Explain the usage of session object with the help of an example.

End Semester Examination, May 2016

MCA - Fifth Semester

DATA WAREHOUSE AND DATA MINING TECHNIQUES (MCA-5002)
Q.1 State whether the following statements are TRUE or FALSE:

a) Facts are typically numerical values that can be aggregated.

b) The time horizon in data warehouse is usually 1-2 years.

c) Operational meta data defines the structure of data held in operational databases and used by transactional applications.

d) The star schema is composed of four fact tables.

e) Removing duplicate records is a process called data cleaning.

f) In market-basket analysis, for an association rule to have business value, it should have confidence only.

g) Web-usage mining can be used for target advertising.

Answer the following questions:

h) Define support.

i) Define dimension.

j) Define decision tree.


UNIT-I

Q.2 a) What are data marts? Discuss its types in detail.

b) Write a short note on multidimensional data model.
Q.3 Discuss three-tier data warehouse architecture in detail.
   15

UNIT-II

Q.4 a) List and describe the five primitives for specifying a data mining task.
   10
   b) What is data mining? Discuss various applications of data mining.
   5

Q.5 Explain in detail the architecture of data mining system with a diagram.
   15

UNIT-III

Q.6 Discuss about various categories of association rules. Give an example of each.
   15

Q.7 What is clustering? Discuss various types of variables in cluster analysis. Give example of each.
   15

UNIT-IV

Q.8 Write a short note on multimedia databases.
   15

Q.9 Explain in detail the mining of World Wide Web.
   15

End Semester Examination, May 2016

MCA - Fifth Semester

PROGRAMMING IN UNIX (MCA-5003)
Q.1 Multiple choice questions:

a) Unix operating system was first developed by:
   i) Dennis Ritchie
   ii) Bjarne Stroustrup
   iii) Ken Thompson
   iv) Brian Kernighan

b) To delete a directory with all the subdirectories and files we use command:
   i) rmdir
   ii) rm
   iii) rm-r
   iv) rm-f

c) File /dev/null:
   i) Is a file
   ii) Has write permission for all
   iii) Is the unix built in dustbin
   iv) All of these

d) Which command is used to extract specific columns from the file?
   i) Cat
   ii) Cut
   iii) Grep
   iv) Paste

e) Which of the following is not a communication command?
   i) write
   ii) mesg
f) Which of the following command is used to update access and modification time of a file?

i) grep  
ii) WC  
iii) touch  
iv) cat

g) Which command is used to count just the number of characters in a file?

i) wc-l  
ii) wc-c  
iii) wc-w  
iv) wc-r

h) Which of the following command addresses all users who are currently logged on?

i) write  
ii) mail  
iii) wall  
iv) mesg

i) Which command is used to display the characteristics of a process?

i) pid  
ii) du  
iii) ps  
iv) au

j) Which command is used to display and create files?

i) cat  
ii) ri  
iii) ed  
iv) lyrix

UNIT-I

Q.2 What are inodes? What are the various parameters stored in inode relating to a file or a directory? Illustrate with a suitable example.
Q.3 What is the usual permission setting for a file and a directory? What are the various ways to change the permission of a file? Give examples.

15

UNIT-II

Q.4 What do you mean by pipes and filters? How are these helpful in unix environment? Illustrate through suitable examples.

15

Q.5 a) What do you understand by a background process? How will you make a process for background process? What are the advantages and disadvantages of running a process in the background?

10

b) What are the different states of a process?

5

UNIT-III

Q.6 Write a shell script to check whether the number entered by user is prime or not.

15

Q.7 Write a shell script to compare two files. Also check how many words are common in files and count their frequency as well.

15

UNIT-IV

Q.8 What do you understand by UDP? How is UDP socket useful in unix? Illustrate with a suitable example.

15

Q.9 Explain the following in relation to TCP sockets:

a) Bind
b) Listen

c) Accept

d) Fork

e) Exec

f) Socket function
Q.1 Choose the correct option:

a) The special operators for sub-queries are:
   i) Exists
   ii) Some and All
   iii) Any
   iv) All

b) Select statement include:
   i) Select from where
   ii) Views
   iii) Sequences
   iv) Indexes

c) What are main types of transparency in a DBMS?
   i) Distribution
   ii) Transaction
   iii) Both of them
   iv) None

 d) What are the different strategies regarding the placement of data?
   i) Centralized
   ii) Fragmented
   iii) Selective replication
   iv) All of the above

e) Which operator is used for declaring variables that refer to the database columns?
   i) +
   ii) %
f) Which of the following is not an oracle data type?
   i) CHAR
   DATE
   iii) VARCAHR
   VARCHAR2
   iv) *

   g) If the value of SQLCODE returns zero means:
      i) No exception
      ii) User defined exception
      iii) No-data-found exception
      iv) Server error

   h) Which of the following are the parts of package?
      i) Specification
      ii) Trigger
      iii) Body
      Exception
      iv) 

   i) What command do you use to include an error condition?
      i) Raise error
      ii) Raise-exception
      iii) Raise
      Exception
      iv) 

   j) Trigger is a PL/SQL block that can return value:
      i) True
      False
      ii) $1\frac{1}{2}\times10$

UNIT-I

Q.2 Discuss the advantages and disadvantages of data replication and explain various types of fragmentations with examples.

15

Q.3 a) Compare the different strategies of data allocation.
b) What layers of transparency should be provided with DDBMS? Discuss.

UNIT-II

Q.4 What do you mean by SQL constraints? Explain various types of constraints with an example.

UNIT-III

Q.5 Explain the following:
   a) EF Codd rules of RDBMS.
   b) Components of SQL.
   c) Integrity constraints.

UNIT-IV

Q.6 What are the advantages of PL/SQL? Explain and write a PL/SQL code to check whether a number is even or odd.

Q.7 a) What is the importance of error handling? How errors are handled in PL/SQL?
   b) What is the syntax to create local procedure? Explain with an example.

Q.8 What do you mean by cloud databases? Discuss the various methods to run a database on the cloud. Explain the characteristics and architecture of it.

Q.9 What do you mean by big data? What are the basic characteristics of big data? Discuss its various applications.
Q.1  a) Use of formal reviews are _________.
   b) Formula for calculating function point count for the system is _________.
   c) _________ software development model is most suited to a system where all the
   requirements are known as the start of the project.
   d) Which of the following statement are not true?
      i) A good design methodology should provide a clear division of design from
         implementation.
      ii) A good design methodology should help to minimize future maintenance.
      iii) A good design methodology should encourage shared development of software.
   e) Define software requirements.
   f) Configuration action is not a part of a software quality assurance plan. (True/False)
   g) Draw software configuration diagram.

   ![Diagram]

   h) What does the above diagram shows?
   i) Quality engineer is not usually present in a technical review. (True/False)
   j) What type of software development model is shown in the following diagram?

   ![Diagram]
# UNIT-I

Q.2 Explain W5 HH principle given by Barry Boehm.  

Q.3 Explain the following:  
   a) Metrics in process and project domain.  
   b) Metrics for software quality.  

# UNIT-II

Q.4 What is software project planning? Describe process of planning during the restoration of software project.  

Q.5 Explain the following:  
   a) Software scope and feasibility.  
   b) Software project estimation.  

# UNIT-III

Q.6 Explain the concept of risk in software project management. What are the different software risks? Differentiate between reaction and proactive risk strategies.  

Q.7 Draw and explain the overview of project scheduling in brief.  

# UNIT-IV

Q.8 Write short notes on:  
   a) Statistical software quality assurance.  
   b) Defect prevention planning.  

Q.9 Explain in detail the method of software quality assurance plan.
Q.1 a) GPRS system is an extension to GSM that operates:
   i) Circuit switched  
   ii) Packet switched  
   iii) Both i) and ii)  
   iv) None of the above

b) All CDMA based technologies, 2G and 3G have _________ handovers.
   i) Hard  
   ii) Soft  
   iii) Softer  
   iv) None of the above

c) The access method used in CDMA is CDMA while in GSM it is:
   i) FDMA  
   ii) CDMA  
   iii) TDMA  
   iv) All of the above

d) LTE stands for:
   i) Lite Technical Edge  
   ii) Long Term Evolution  
   iii) Linear Technological Evolution  
   iv) None of the above

e) The core concept used in cellular technology is:
   i) TDM  
   ii) Frequency resuse  
   iii) Code resuse  
   iv) None of the above

f) Which of the following are the main parts of basic cellular system?
   i) A mobile unit  
   ii) A cell site  
   iii) A mobile telephone switching office  
   iv) All of the above

g) The basic GSM is based on _________ traffic channels.
   i) Connection oriented  
   ii) Connection less  
   iii) Packet switching  
   iv) Circuit switching

h) In _________ frequency spectrum is divided into smaller spectra and is allocated to each user.
i) FDMA ii) TDMA
iii) CDMA iv) FGMA

i) WAP stands for:
   iii) Wireless Access Protocol iv) None of the above

j) The three tiers of mobile computing architecture are __________, __________ and __________.

**UNIT-I**

Q.2 What are wireless networks? What are the generations of wireless networks? Explain the concept of cellular technology.  

Q.3 a) What are the advantages and limitations of mobile computing?  
     b) Explain the architecture of mobile computing.

**UNIT-II**

Q.4 Explain the architecture of wireless application protocol in detail.

Q.5 a) Explain security in wireless LAN.
     b) Differentiate Adhoc v/s Infrastructure mode in wireless networks.
     c) Differentiate various authentication modes in wireless networks.

**UNIT-III**

Q.6 a) Write a short note on Adhoc wireless internet.
     b) Explain dynamic state routing algorithm in detail.

Q.7 a) Explain problems of message routing in wireless Adhoc mobile networks.
     b) Explain Adhoc on Demand Distance Vector (ADDV) algorithm in detail.

**UNIT-IV**
Q.8 Write short notes on:
   a) Bluetooth
   b) RFID
   c) Hyper LAN

Q.9 a) What are the goals of mobile IP?
   b) Explain agent discovery and registration in mobile IP.
End Semester Examination, May 2016
B. Sc. (Information Technology) - First Semester
MATHEMATICS FOR COMPUTING (7.107)

Time: 3 hrs
Max Marks: 50
No. of pages: 2

Note: Attempt FIVE questions in all; Q.1 is compulsory. Attempt any TWO questions from Part A and TWO questions from Part B. All questions carry equal marks.

Q.1  a) Define Cartesian product with the help of an example.
     b) What is a square matrix?
     c) Define a directed graph.
     d) Give formula to calculate median of a grouped data.
     e) What do you mean by intersection of two sets? 2x5

     PART-A

Q.2  If $f, g : R \rightarrow R$ are defined respectively by:
     $f(x) = 2x^2 + 2x - 1$
     $g(x) = 3x - 2$
     Find formula for the following:
     a) $fog$  b) $gof$  c) $fuf$  d) $gog$  e) $fog^2$ 2x5

Q.3  If $U = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$
     $A = \{8, 9, 10\}$  $B = \{4, 5, 6, 7\}$
     $C = \{3, 7, 8, 9, 10\}$  $D = \{4, 8, 9, 10\}$
     Find the following:
     a) $(A - D) \cap (B \cap D)$
     b) $(B \cap A) \cup C'$
     c) $(A \cup B) \cup (B \cup D)$
     d) $(B - A) \cup (B \cap A) \cup C'$
     e) $(A' \cup B') \cup (D')$ 2x5

Q.4  Find the adjoint of the following matrix:
     $A = \begin{bmatrix} 1 & 2 & 3 \\ 2 & 3 & 2 \\ 3 & 3 & 4 \end{bmatrix}$
     10

     PART-B

Q.5  For the following data, find median, mode and standard deviation:

<table>
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<tr>
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</thead>
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</tr>
</tbody>
</table>

10
End Semester Examination, May 2016  
B. Sc. (Information Technology) - First Semester  
THE INFORMATION TECHNOLOGY SYSTEM (7.101)

Time: 3 hrs  
Max Marks: 50  
No. of pages: 1

Note: Attempt FIVE questions in all; Q.1 is compulsory. Attempt any TWO questions from Part A and TWO questions from Part B. All questions carry equal marks.

Q.1  a) Differentiate between Redhat hocker and whitehat haker.  
b) Name five output devices and their uses.  
c) What is application software? Name an two application softwares.  
d) How header and footer can be inserted into a document? Explain its steps.  
e) How do charts and graphs help in analyzing data?  

2x5

PART-A

Q.2  a) How is primary memory beneficial for a computer system? Also explain the advantages and disadvantages of primary memory in brief.  
b) How is serial port different from the parallel port?  

5

Q.3  a) In what ways “internet can help public service agencies to improve their services to the public?” Justify your answer.  
b) What are the various ways to manage online annoyances?  

5

Q.4  a) What is the need of system software? Explain its advantages.  
b) What are the basic trouble shooting techniques you do when your system does not start up?  

5

PART-B

Q.5  a) What is a network architecture? Explain OSI network model in brief.  
b) What are the various steps to protect computers from the threats?  

5

Q.6  a) What are the advantages of various built-in-functions in MS-excel? Explain all mathematical functions with proper syntax and suitable examples.  
b) What is relative and absolute cell addressing?  

7

Q.7  a) What is ‘mail merge’? Explain step-by-step process to perform mail merge with a suitable example.  
b) Discuss various methods of applying slide animation and custom animation in a power point presentation.  

5
End Semester Examination, May 2016
B. Sc. (Information Technology) – First Semester
THE INFORMATION TECHNOLOGY SYSTEM (7.101)

Time: 3 hrs  Max Marks: 75
No. of pages: 1

Note: Attempt FIVE questions in all; Q.1 is compulsory. Attempt any TWO questions from Part A and TWO questions from Part B. Each question carries equal marks.

Q.1  a) Name the different types of ROM.
b) Name there application layer protocols.
c) What is a URL?
d) Define DNS.
e) Virus are different from worms. How?
f) How to define COUNT in MS-EXCEL?
g) What is CPU?
h) What is mobile computing?
i) Name any three ports.
j) Define Netware.  $1\frac{1}{2}\times10$

PART-A

Q.2  a) What is the significance of computer in today’s world?  5
b) Explain audio and video and compare them in detail.  10

Q.3  Define internet. Explain different internet technologies in detail with the help of examples.  15

Q.4  Identify computer hardware, peripherals and terminology in detail with examples.  15

PART-B

Q.5  a) What is network architecture? Define its types with an example in detail.  10
b) What are the different features of WINDOWS operating system?  5

Q.6  Why we use MS-PowerPoint? How it help us in day to day life? What are the software and hardware requirement for the same?  15

Q.7  a) Write down 10 short cut keys used in MS-WORD.  5
b) What is Pivot Table? Give some examples where it.  5
c) Why we use MS-ACCESS? How is it different from MS-EXCEL?  5
End Semester Examination, May 2016
B. Sc. (Information Technology) – First Semester
BUSINESS COMMUNICATION (7.102)

Time: 3 hrs
Max Marks: 50
No. of pages: 2

Note: Attempt FIVE questions in all; Q.1 is compulsory. Attempt any TWO questions from Part A and TWO questions from Part B. Each question carries equal marks.

Q.1 State whether TRUE or FALSE:
   a) Disturbances/distractions in the environment are a result of physical noise.
   b) “Relevance” means adherence to a set of logically and sequentially arranged utterances.
   c) Listening is equivalent to heaving with intelligent deciphering of the phonetic sounds being produced by the sender.
   d) You can win others to your side an accomplish tasks by adopting an assistive stance.
   Choose the correct option:
   e) Errors in languages, grammar, or visual representation of facts take away:
      i) Clarity                      ii) Correctness
      iii) Crispness                iv) Conciseness
   f) “You are one of the sloppiest team members I have ever had” is Milind’s favorite catch-line. Little does he realize that his statement does put the receiver on hold as he is?
      i) Demonstrating egoistical trails.
      ii) Using a negative statement.
      iii) Stressing that he is the boss.
   g) Devender Mahajan, CEO, needs to get the rest of his group motivated in times of recession. His closing of a presentation should be as follows:
      i) “Let us work together to achieve targets”.
      ii) “We will provide a bonus if you are able to achieve targets”.
      iii) “Let us discuss what needs to be done”.
      iv) None of the above.
   h) Evading eye contract, as per the discussion with the professor, means:
      i) Shy                      ii) Not confident
      iii) Cultural trait         iv) None of the above
   i) Encoding in the process in which:
      i) The sender writes down the message in morse code.
      ii) The sender converts the ideas into message.
      iii) The receiver writes the message in brief.
   j) The full form of KISS in relevance to communication is _____________.

PART-A

Q.2 a) How does communication help you at work and outside work? What are the benefits associated with effective communication?  
    b) What is the impact of using too much or too little information in one’s communication?  

Q.3 a) How does one make one’s communication more receivers centric?  
    b) Mention the 7 C’s in communication.
End Semester Examination, May 2016
B. Sc. (Information Technology) - First Semester
FUNDAMENTALS OF COMPUTER PROGRAMMING (7.103)

Time: 3 hrs
Max Marks: 80
No. of pages: 1

Note: Attempt FIVE questions in all; Q.1 is compulsory. Attempt any TWO questions from Part A and TWO questions from Part B. All questions carry equal marks.

Q.1 a) Define server explorer windows.
b) Define variables.
c) What is the property of text button? Name any two.
d) Which function is used to read data from a text file?
e) What are implicit and explicit conversions?
f) Differentiate between a structure and a function.
g) Differentiate between a listbox and a combobox.
h) Differentiate between a run time and a compile time error.
i) What is the role of solution window in visual studio?
j) Define modularization.

PART-A

Q.2 a) What makes a good programming language? Explain the attributes of a good language.
b) Explain the role of a programming language.
c) Write a short note on C# coding window.

Q.3 a) What are the basic controls used in toolbox? Explain them with the help of properties of each control.
b) Explain various types of arithmetic operators with the help of examples.

Q.4 a) Write a program in C# to add two matrices.
b) Explain conversion functions in C#.

PART-B

Q.5 a) What are the steps follows in handling the error using try catch block?
b) What are the types of errors encountered in programming languages?

Q.6 a) How can one process and modify the text file contents?
b) Explain recursive procedures in detail.
c) How can one process list of data with the help of doloop? Explain it with an example.

Q.7 a) Explain in detail relational and logical operators with suitable examples.
b) What are the various keyboard and mouse events? Explain each of them in brief.
End Semester Examination, May 2016  
B. Sc. (Information Technology) – First Semester  
FUNDAMENTALS OF COMPUTER PROGRAMMING (7.103)

Time: 3 hrs  
Max Marks: 120  
No. of pages: 1

Note: Attempt FIVE questions in all; Q.1 is compulsory. Attempt any TWO questions from Part A and TWO questions from Part B. Each question carries equal marks.

Q.1  Explain any three: 
a) Which feature of .NET framework makes it platform independent? Write a short note on the same.  
b) Differentiate between C# and C++.  
c) Differentiate syntax errors and semantic errors.  
d) Compare: conditional operator and if ()... else statement.  

\[\text{8} \times 3\] 

PART-A

Q.2  a) What symbols are used in flowcharts and explain their uses also.  
b) Write a flowchart for calculation of simple interest.  
c) What do you mean by a pseudo code and explain its importance?  

\[\text{4} \times 10 \times 10 \times 4\] 

Q.3  a) What are the components of Common Language Runtime (CLR)? Explain with the help of an example.  
b) What do you mean by IDE? What are the components of IDE?  
c) Write four benefits of .NET framework.  

\[\text{10} \times 10 \times 4\] 

Q.4  a) What do you mean by feasibility in software development? What are the types of feasibility?  
b) Give any ten in-built string functions and write their uses.  
c) What are keywords? Name any four keywords of C#.  

\[\text{10} \times 10 \times 4\] 

PART-B

Q.5  a) Differentiate between while () and do...while () statement.  
c) What is the use of switch () statement in C#. Justify with an example.  

\[\text{14} \times 10\] 

Q.6  a) Write a program in C# to implement a matrix multiplication.  
b) Write a short note on if ()... else statement.  

\[\text{20} \times 4\] 

Q.7  a) Write a program in C# to sort a given list using arrays.  
b) What is the difference between for () loop and for each () loop? Justify with an example.  
c) Write a short note on debugging.  

\[\text{10} \times 10 \times 4\]
End Semester Examination, May 2016
B. Sc. (Information Technology) – Second Semester
DATABASE ENGINEERING-I (7.104)

Time: 3 hrs Max Marks: 50
No. of pages: 1

Note: Attempt FIVE questions in all; Q.1 is compulsory. Attempt any TWO questions from Part A and TWO questions from Part B. Each question carries equal marks.

Q.1 Write short notes on any two of the following:
   a) Data vs Information.
   b) Data Independence.
   c) Constraints in Sql.
   d) Joins.
   e) Normalization. 5x2

PART-A

Q.2 Explain the advantages and disadvantages of database system over a file system. 10

Q.3 Explain the following terms:
   a) Schema.
   b) Instance.
   c) Second Normal Form (2NF).
   d) Data Model. 2½x4

Q.4 Explain the Third Normal Form (3NF) with the help of an example. 10

PART-B

Q.5 Explain five DML statements with proper syntax and examples. 10

Q.6 Explain the following terms:
   a) Primary Key.
   b) Super Key.
   c) View.
   d) Index. 2½x4

Q.7 What do you mean by business analysis? Explain the use of intelligent tools in the promotion of a business using an example. 10
End Semester Examination, May 2016
B. Sc. (Information Technology) - Second Semester
COMPUTER NETWORKS-I (7.105)

Time: 3 hrs
Max Marks: 50
No. of pages: 1

Note: Attempt FIVE questions in all; Q.1 is compulsory. Attempt any TWO questions from Part A and TWO questions from Part B. All questions carry equal marks.

Q.1  a) Is there any difference between internet and intranet? Explain.
     b) List the application layer protocols.
     c) Why do we need network security?
     d) Define standardization. Which agency define the standards and protocols for the OSI model?
     e) Define bandwidth, throughput and data rate. 2×5

PART-A

Q.2  Explain wireless LAN with its layers and frame formats. How are they different from wired LAN’s? 10

Q.3  Explain the OSI model. Name all the protocols which work on different layers of OSI model. How OSI model is different from TCP/IP model? 10

Q.4  How can a mobile network be implemented? Explain different generations of cellular networks. 10

PART-B

Q.5  a) Differentiate between connection-oriented and connectionless networking. Explain it with reference to TCP and UPD protocols. 5
     b) What is the role of DNS in data communication? Support your answer with the help of an example. 5

Q.6  What are the performance issues involved in computer networking? Also explain distributed computer networks in brief. 10

Q.7  Write short note on:
     a) Network security
     b) IPV4 5×2
End Semester Examination, May 2016
B. Sc. (Information Technology) - First Semester
BUSINESS ENVIRONMENT (7.106)

Time: 3 hrs

Max Marks: 50
No. of pages: 1

Note: Attempt FIVE questions in all; Q.1 is compulsory. Attempt any TWO questions from Part A and TWO questions from Part B. All questions carry equal marks.

Q.1 Write short notes on (any five):
   a) Define business environment.
   b) Write a brief note on economic system.
   c) International environment.
   d) “Business system is a part of economic system”. Explain this statement.
   e) What are the two types of organizational cultures?
   f) Foreign direct investment.  
       2x5

   PART-A

Q.2 How internal environment of a business is affected by a organizational culture, structure and strategies? Explain your answer by taking an example. 10

Q.3 Discuss the role of customer relationship competitors and suppliers in the business environment. 10

Q.4  a) Describe any five differences among industry, commerce and trade. 5
    b) Write any five strategies that affect the organization culture. 5

   PART-B

Q.5 What are the exceptions to the law of demand? Explain them with examples. 10

Q.6 Distinguish between the following:
   a) Quantitative and qualitative barriers of trade.
   b) Customs and manners. 5x2

Q.7 “Technological advancements is an important tool for the successful growth of a business”. Justify your answer with the help of an example. 10
End Semester Examination, May 2016
B. Sc. (Information Technology) - First Semester
MATHEMATICS FOR COMPUTING (7.107)

Time: 3 hrs
Max Marks: 50
No. of pages: 2
Note: Attempt FIVE questions in all; Q.1 is compulsory. Attempt any TWO questions from Part A and TWO questions from Part B. All questions carry equal marks.

Q.1 a) Define Cartesian product with the help of an example.
b) What is a square matrix?
c) Define a directed graph.
d) Give formula to calculate median of a grouped data.
e) What do you mean by intersection of two sets? 2x5

PART-A

Q.2 If \( f, g : R \to R \) are defined respectively by:
\[
\begin{align*}
    f(x) &= 2x^2 + 2x - 1 \\
    g(x) &= 3x - 2
\end{align*}
\]
Find formula for the following:
a) \( f \circ g \)  b) \( g \circ f \)  c) \( f \circ f \)  d) \( g \circ g \)  e) \( f \circ f^2 \) 2x5

Q.3 If \( U = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\} \)
\( A = \{8, 9, 10\} \quad B = \{4, 5, 6, 7\} \)
\( C = \{3, 7, 8, 9, 10\} \quad D = \{4, 8, 9, 10\} \)
Find the following:
a) \( (A - D) \cap (B \cap D) \)  
b) \( (B \cap A) \cup C' \)  
c) \( (A \cup B) \cup (B \cup D) \)  
d) \( (B - A) \cup (B \cap A) \cup C' \)  
e) \( (A' \cup B') \cup (D') \) 2x5

Q.4 Find the adjoint of the following matrix:
\[
A = \begin{bmatrix}
1 & 2 & 3 \\
2 & 3 & 2 \\
3 & 3 & 4
\end{bmatrix}
\]

PART-B

Q.5 For the following data, find median, mode and standard deviation:

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</table>

10
End Semester Examination, May 2016
B. Sc. (Information Technology) - Second Semester
SYSTEMS TESTING (7.202)

Time: 3 hrs  Max Marks: 40
No. of pages: 1

Note: Attempt FIVE questions in all; Q.1 is compulsory. Attempt any TWO questions from Part A and TWO questions from Part B. All questions carry equal marks.

Q.1 Write short notes on:
   a) What is functional testing?
   b) What are the risks in software development?
   c) What are objectives of software testing? 4x2

PART-A

Q.2 What is IEEE standard and why it is important for software engineering? 8
Q.3 What is role of quality assurance in software development? 8
Q.4 Name any two types of white-box testing and explain them in brief. 8

PART-B

Q.5 a) What is software metric?
   b) What is test environment? 4x2

   b) Why ISO certified organizations are preferred by clients for their projects? 5 3

Q.7 Explain verification and validation (V&V) model for software testing. 8
End Semester Examination, May 2016
B. Sc. (Information Technology) - Second Semester
REQUIREMENT MODELLING (7.217)

Time: 3 hrs  Max Marks: 40
No. of pages: 1

Note: Attempt FIVE questions in all; Q.1 is compulsory. Attempt any TWO questions from Part A and TWO questions from Part B. All questions carry equal marks.

Q.1 Write short notes on (any two):
   a) Information reuse.
   b) Use case.
   c) Economic feasibility.  4x2

   PART-A

Q.2 How will you gather requirements for an information system? Discuss by taking a suitable example.  8

Q.3 What do you understand by an information system? What is the purpose of an information system?  8

Q.4 List various software models and also describe the two merits of each model.  8

   PART-B

Q.5 What are the strategies of a business analyst? Discuss.  8

Q.6 How will you communicate the information requirement? What are the various information requirements?  8

Q.7 Draw a use case diagram of payroll management system.  8
End Semester Examination, May 2016  
B. Sc. (Information Technology) - Second Semester  
SYSTEMS TESTING (7.202)

Time: 3 hrs  
Max Marks: 40  
No. of pages: 1  

Note: Attempt FIVE questions in all; Q.1 is compulsory. Attempt any TWO questions from Part A and TWO questions from Part B. All questions carry equal marks.

Q.1 Write short notes on:  
b) What are the risks in software development?  
c) What are objectives of software testing?  

PART-A

Q.2 What is IEEE standard and why it is important for software engineering?  

Q.3 What is role of quality assurance in software development?  

Q.4 Name any two types of white-box testing and explain them in brief.  

PART-B

Q.5 a) What is software metric?  
b) What is test environment?  

b) Why ISO certified organizations are preferred by clients for their projects?  

Q.7 Explain verification and validation (V&V) model for software testing.  


End Semester Examination, May 2016
B. Sc. (Information Technology) - Second Semester
REQUIREMENT MODELLING (7.217)

Time: 3 hrs
Max Marks: 40
No. of pages: 1

Note: Attempt FIVE questions in all; Q.1 is compulsory. Attempt any TWO questions from Part A and TWO questions from Part B. All questions carry equal marks.

Q.1 Write short notes on (any two):
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   PART-A

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Q.4 List various software models and also describe the two merits of each model. 8

   PART-B

Q.5 What are the strategies of a business analyst? Discuss. 8

Q.6 How will you communicate the information requirement? What are the various information requirements? 8

Q.7 Draw a use case diagram of payroll management system. 8
End Semester Examination, May 2016
B. Sc. (IT) – Second Semester
ENGLISH FOR ACADEMIC PURPOSES-II B (EAP-II B)

Time: 3 hrs

Max Marks: 50
No. of pages: 4

Instructions to candidates regarding number of questions to be answered etc., should be indicated in space provided below:

Note: All questions are compulsory.

Q.1  Read the following passage carefully and answer the questions below:
Discovered in the early 1800s and named ‘nicotianine’, the oily essence now called nicotine is the main active ingredient of tobacco. Nicotine, however, is only a small component of cigarette smoke, which contains more than 4,700 chemical compounds, including 43 cancer-causing substances. In recent times, scientific research has been providing evidence that years of cigarette smoking vastly increases the risk of developing fatal medical conditions.

Greenhouse gases arise from a wide range of sources and their increasing concentration is largely related to the compound effects of increased population, improved living standards and changes in lifestyle. From a current base of 5 billion, the United Nations predicts that the global population may stabilise in the twenty-first century between 8 and 14 billion, with more than 90 per cent of the projected increase taking place in the world’s developing nations. The associated activities to support that growth, particularly to produce the required energy and food, will cause further increases in greenhouse gas emissions. The challenge, therefore, is to attain a sustainable balance between population, economic growth and the environment.

The major greenhouse gas emissions from human activities are carbon dioxide (CO2), methane and nitrous oxide. Chlorofluorocarbons (CFCs) are the only major contributor to the greenhouse effect that does not occur naturally, coming from such sources as refrigeration, plastics and manufacture. Coal’s total contribution to greenhouse gas emissions is thought to be about 18 per cent, with about half of this coming from electricity generation.

The worldwide coal industry allocates extensive resources to researching and developing new technologies and ways of capturing greenhouse gases. Efficiencies are likely to be improved dramatically, and hence CO2 emissions reduced, through combustion and gasification techniques which are now at pilot and demonstration stages.

Clean coal is another avenue for improving fuel conversion efficiency. Investigations are under way into super-clean coal (35 per cent ash) and ultracean coal (less than 1 per cent ash). Super-clean coal has the potential to enhance the combustion efficiency of conventional pulverised fuel power plants. Ultracean coal will enable coal to be used in advanced power systems such as coal-fired gas turbines which, when operated in combined cycle, have the potential to achieve much greater efficiencies.
End Semester Examination, May 2016  
B. Sc. (Information Technology) - Third Semester  
OBJECT ORIENTED PROGRAMMING (7.205)

Time: 3 hrs  
Max Marks: 50  
No. of pages: 1

Note: Attempt FIVE questions in all; Q.1 is compulsory. Attempt any TWO questions from Part A and TWO questions from Part B. All questions carry equal marks.

Q.1 Write short notes on (any two):  
a) Inline function.  
b) Class.  
c) Abstraction.  

PART-A  
5x2

Q.2 a) What are variables? List C++ rules for variables naming.  
b) Explain all elements of object oriented programming.  

Q.3 What are constructors and destructors? Explain how they are different from normal functions.  

Q.4 Differentiate the following (any two):  
a) Virtual vs pure virtual function.  
b) Function overloading vs overriding.  
c) Multiple and multilevel inheritance.  

PART-B  
5x2

Q.5 What is visibility mode? What are different inheritance visibility modes supported by C++? Explain.  

Q.6 What are different forms of inheritance supported by C++? Explain them with examples.  

Q.7 Explain any two techniques of passing arguments to a function.  

10

10

10
End Semester Examination, May 2016
B. Sc. (Information Technology) - Third Semester
DATABASE ENGINEERING-II (7.214)

Time: 3 hrs

Max Marks: 40
No. of pages: 1

Note: Attempt FIVE questions in all; Q.1 is compulsory. Attempt any TWO questions from Part A and TWO questions from Part B. All questions carry equal marks.

Q.1 Answer the following:
   a) Define SQL.
   b) How a table is created in SQL? Write the query for same in proper format.
   c) Which data type is entered in SQL? Describe its format.
   d) Define attribute and table with suitable example. 2x4

PART-A

Q.2 Explain the Codd's 12 rules used in relational model. 8

Q.3 Explain the following commands in with suitable syntax and examples:
   a) Delete and drop table.
   b) Alter table and update. 4x2

Q.4 Discuss the various character functions used in ORACLE with proper syntax. 8

PART-B

Q.5 a) Define database trigger in brief. 3
    b) Explain the various components of database trigger with a suitable example. 5

Q.6 a) Discuss database security in brief. 4
    b) Discuss the various mechanism to manage the database security. 4

Q.7 Explain the process to create a function and to drop an existing function in PL/SQL in detail. 8
End Semester Examination, May 2016
B. Sc. (Information Technology) – Fourth Semester
PERSONALITY DEVELOPMENT-IV (IT.403)

Time: 3 hrs  Max Marks: 50
No. of pages: 1

Note: Attempt FIVE questions in all; Q.1 is compulsory. Attempt any TWO questions from Part A and TWO questions from Part B. Each question carries equal marks.

Q.1 Write short notes on (any five):
   a) Time management matrix.
   b) Body language.
   c) Self awareness.
   d) Activity logging.
   e) Cover letter.
   f) Emotional intelligence. 2×5

   PART-A

Q.2 Why is time management important? How is it helpful in leading a successful life? Explain the concept of activity logging in brief. 10

Q.3 What is emotional self-awareness? Analyze yourself and write about 300 words describing your emotional traits. 10

Q.4 How do you handle objections raised by a customer? What do you mean by customer satisfaction and customer delight? 10

   PART-B

Q.5 You received information about a vacancy for software developer in your dream company through an acquaintance who already works there. Prepare a cover letter and curriculum vitae to be sent to the company. 10

Q.6 What are the different forms of group discussion? Explain the Do’s and Don’ts to be kept in mind during a group discussion. 10

Q.7 How will you dress up for an interview? How will you conduct yourself in front of the interviewing panel? 10
End Semester Examination, May 2016
B. Sc. (Information Technology) – Fourth Semester
OPERATING SYSTEMS (7.221)

Time: 3 hrs

Max Marks: 40
No. of pages: 2

Note: Attempt FIVE questions in all; Q.1 is compulsory. Attempt any TWO questions from Part A and TWO questions from Part B. Each question carries equal marks.

Q.1 a) A process is _________.
b) Logical address is _________.
c) Which one of the following is not the function of operating systems?
   i) Resource Management.
   ii) Networking.
   iii) File Management.
   iv) Process Management.
d) First in First out (FIFO) scheduling is:
   i) Non-preemptive scheduling.
   ii) Preemptive scheduling.
   iii) Fair share scheduling.
   iv) Deadline scheduling.
e) Name any Multitasking Operating System.
f) What is aging in priority scheduling algorithm?
g) In which of the following storage placement strategies a program is placed in the largest available hole in memory?
   i) First fit
   ii) Best fit
   iii) Worst fit
h) The file system NTFS stands for:
   i) New Type File System.
   ii) Never Terminated File System.
   iii) New Technology File System.
   iv) Non Terminated File System. 1×8

PART-A

Q.2 a) Write short notes on:
   i) Real time operating system.
   ii) Multiprocessing system. 2×2
b) What is interprocess communication? How it can be achieved between processes? 4

Q.3 a) What is a semaphore? How semaphores can be implemented in operating system? 4
b) What is a thread? Explain the benefits of the multithreaded programming. 4

Q.4 a) What are the necessary conditions of the deadlocks? Explain them. 3
b) Consider the following snapshot of a system.

<table>
<thead>
<tr>
<th></th>
<th>Allocation</th>
<th>Max</th>
<th>Available</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A B C D</td>
<td>A B C D</td>
<td>A B C D</td>
</tr>
<tr>
<td>P₀</td>
<td>0 0 1 2</td>
<td>0 0 1 2</td>
<td>1 5 2 0</td>
</tr>
<tr>
<td>P₁</td>
<td>1 0 0 0</td>
<td>1 7 5 0</td>
<td></td>
</tr>
<tr>
<td>P₂</td>
<td>1 3 5 4</td>
<td>2 3 5 6</td>
<td></td>
</tr>
<tr>
<td>P₃</td>
<td>0 6 3 2</td>
<td>0 6 5 2</td>
<td></td>
</tr>
<tr>
<td>P₄</td>
<td>0 0 1 4</td>
<td>0 6 5 6</td>
<td></td>
</tr>
</tbody>
</table>

Answer the following question using banker’s algorithm:
   i) What are the content of the Need Matrix?
   ii) Is the system in a safe state?
   iii) If a request from Process P₁ arrives for (0, 4, 2, 0), can the request be granted immediately. 3
End Semester Examination, May 2016
B. Sc. (Information Technology) - Fourth Semester
WEB APPLICATION DEVELOPMENT (7.303)

Time: 3 hrs
Max Marks: 50
No. of pages: 1

Note: Attempt Five questions in all; Q.1 is compulsory. Attempt any TWO questions from Part A and TWO questions from Part B. All questions carry equal marks.

Q.1 Write short notes on:
   a) Structure of HTML.  
   b) MySQL database.  5x2

PART-A

Q.2 Differentiate between internal and external style sheets with examples.  10

Q.3 a) What are frames in HTML? Explain the usage of frames with appropriate examples.  5
    b) Create a railway reservation table using different attributes of table.  5

Q.4 Write short notes on:
   a) AJAX extension.  
   b) Server controls.  5x2

PART-B

Q.5 How can a website be secured? Explain the process of authentication and authorization.  10

Q.6 Explain the three layer architecture of ASP.NET.  10

Q.7 a) What is web service in ASP.NET?
    b) Explain “compare validator” in ASP.NET using an example.  10
End Semester Examination, May 2016
B. Sc. (Information Technology) - Fourth Semester
DESKTOP APPLICATIONS DEVELOPMENT (7.206)

Time: 3 hrs

Max Marks: 50
No. of pages: 1

Note: Attempt Five questions in all; Q.1 is compulsory. Attempt any TWO questions from Part A and TWO questions from Part B. All questions carry equal marks.

Q.1 Differentiate between following (any two):
   a) ComboBox and ListBox.
   b) Data set view and data grid view.
   c) Binding source and Binding navigator. 5x2

PART-A

Q.2 What is integrated development environment (IDE)? How IDE is useful to make successful application software? Explain your answer by giving all the features of IDE in context to RAD (rapid application development). 10

Q.3 What are the different types of controls in VB.NET? Explain any five types of controls along with their functionality. 10

Q.4 “ADO.NET is more powerful then ADO”. Discuss the different advantages and features of ADO.NET in context to database development in VB.NET. 10

PART-B

Q.5 What are the different features of object oriented programming systems in context to VB.NET? ‘Implementing the OOPS concepts gives more security to application software’. Discuss. 10

Q.6 Explain the difference between factory method pattern and decorator pattern. How these pattern are useful in making the software successful? 10

Q.7 Discuss the terms: visibility, scalability and maintainability in context to data access layer while implementing object oriented concepts in VB.NET. 10
End Semester Examination, May 2016  
B. Sc. (Information Technology) – Fourth Semester  
INFORMATION SYSTEM SECURITY (7.209)

Time: 3 hrs.  
Max Marks: 40  
No. of pages: 1  

Note: Attempt ANY FIVE questions in all; Q.1 is compulsory. Attempt ANY TWO questions from PART-A and TWO questions from PART-B.

Q.1 Write short notes on the following (any four):  
a) Components of C.I.A.  
b) Physical security devices.  
c) Risk Assessment.  
d) Digital forensics.  
e) Vulnerability.  

PART-A

Q.2 Briefly explain the components of an information system and their security. How will you balance between security and access?  

Q.3 Explain the security system development life cycle.  

Q.4 What are the risk control strategies? How these strategies guide an organization? Elaborate.  

PART-B

Q.5 Differentiate between the following:  
a) Issue specific security policy and System specific security policy.  
b) Authentication and Authorization.  

Q.6 Explain the role of firewall in information security by taking a suitable example.  

Q.7 List and describe the four basic conversion strategies that are used when converting to a new system. Under which circumstances each of these is best approach? Explain.
End Semester Examination, May 2016
B. Sc. (Information Technology) - Fourth Semester
WEB APPLICATION DEVELOPMENT (7.303)

Time: 3 hrs

Note: Attempt Five questions in all; Q.1 is compulsory. Attempt any TWO questions from Part A and TWO questions from Part B. All questions carry equal marks.

Q.1 Write short notes on:
   a) Structure of HTML.  
   b) MySQL database.  

   PART-A

Q.2 Differentiate between internal and external style sheets with examples.  
Q.3 a) What are frames in HTML? Explain the usage of frames with appropriate examples.  
   b) Create a railway reservation table using different attributes of table.  

Q.4 Write short notes on:
   a) AJAX extension.  
   b) Server controls.  

   PART-B

Q.5 How can a website be secured? Explain the process of authentication and authorization.  
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End Semester Examination, May 2016
B. Sc. (Information Technology) – Fourth Semester
OPERATING SYSTEMS (7.221)

Time: 3 hrs  Max Marks: 40
No. of pages: 2

Note: Attempt FIVE questions in all; Q.1 is compulsory. Attempt any TWO questions from Part A and TWO questions from Part B. Each question carries equal marks.

Q.1  a) A process is ________.
    b) Logical address is ________.
    c) Which one of the following is not the function of operating systems?
    d) First in First out (FIFO) scheduling is:
       i) Non-preemptive scheduling. ii) Preemptive scheduling.
       iii) Fair share scheduling. iv) Deadline scheduling.
    e) Name any Multitasking Operating System.
    f) What is aging in priority scheduling algorithm?
    g) In which of the following storage placement strategies a program is placed in the largest available hole in memory?
       i) First fit ii) Best fit
       iii) Worst fit
    h) The file system NTFS stands for:
       iii) New Technology File System. iv) Non Terminated File System. 1×8

PART-A

Q.2  a) Write short notes on:
       i) Real time operating system.
       ii) Multiprocessing system. 2×2
    b) What is interprocess communication? How it can be achieved between processes? 4

Q.3  a) What is a semaphore? How semaphores can be implemented in operating system? 4
    b) What is a thread? Explain the benefits of the multithreaded programming. 4

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<td>1 7 5 0</td>
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<td></td>
</tr>
<tr>
<td>P_3</td>
<td>0 6 3 2</td>
<td>0 6 5 2</td>
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Answer the following question using banker’s algorithm:
    i) What are the content of the Need Matrix?
    ii) Is the system in a safe state?
    iii) If a request from Process P_1 arrives for (0, 4, 2, 0), can the request be granted immediately. 3
End Semester Examination, May 2016
B. Sc. (Information Technology) - Sixth Semester
MOBILE COMMUNICATION (369.606)

Time: 3 hrs  Max Marks: 50
No. of pages: 1

Note: Attempt FIVE questions in all; Q.1 is compulsory. Attempt any TWO questions
from Part A and TWO questions from Part B. All questions carry equal marks.

Q.1 Write short notes on:
  a) Ad hoc networks.
  b) Bluetooth.  5x2

PART-A

Q.2 What is multiplexing? What are the various types of multiplexing techniques? Explain
with a diagram.  10

Q.3  a) Differentiate between soft, softer and hard handovers.  5
     b) What are cellular networks? Explain with diagrams.  5

Q.4  a) Differentiate between analog and digital signals.  5
     b) What is phase and amplitude modulation? Explain with a diagram.  5

PART-B

Q.5 What are IEEE 802.11 wireless networks? Explain the architecture of IEEE 802.11 in
detail.  10

Q.6 Write short notes on:
  a) Mobile IP  5
  b) HiperLAN  5

Q.7 What is wireless application protocol? Explain its architecture in detail.  10
End Semester Examination, May 2016
B. Sc. (Information Technology) - Sixth Semester
PROGRAMMING WITH JAVA (369.607)

Time: 3 hrs
Max Marks: 50
No. of pages: 1

Note: Attempt Five questions in all; Q.1 is compulsory. Attempt any TWO questions from Part A and TWO questions from Part B. All questions carry equal marks.

Q.1 Answer any two:
   a) Importance of java virtual machine.
   b) Features of java programming.
   c) Significance of ‘this’ keyword.
   d) Use of static variables and static method.  \(5 \times 2\)

   \[
   \text{PART-A}
   \]

Q.2 a) Explain the concept of arrays. What are the different types of array available in java? \(6\)
b) What is inheritance? Discuss the types of inheritance with suitable examples. \(4\)

Q.3 What is a constructor? What are its special properties? How do we invoke a constructor? \(10\)

Q.4 Discuss the tools available in JDK. How do they help in application development? \(10\)

   \[
   \text{PART-B}
   \]

Q.5 What is an exception? How does the ‘try....catch’ mechanism handle an exception? \(10\)

Q.6 Explain the difference between overloading and overriding function. \(10\)

Q.7 Write applet to draw:
   a) Human face  b) Traffic light \(10\)
BUSINESS PROCESSES (CS-610)

Time: 2hrs
Max Marks: 50
No. of pages: 1

Note: Attempt FIVE questions in all; Part A is compulsory. Attempt any FOUR questions from Part B. Each question carries equal marks.

PART-A

Q.1 a) What does “R” symbolizes in R3?
   b) Name various products offered by SAP.
   c) Status bar on a SAP system has what all information.
   d) What is F1/F4 used for?
   e) Which SAP components are included in SAP CRM?
   f) Which applications are parts of a production process?
   g) What is SAP SRM?
   h) What are the key functional areas of SAP PLM?
   i) What is Sarbanes Oxley Act of 2002?
   j) Give full form of US GAAP and LAS.  

PART-B

Q.2 Discuss SAP's business suite and its various applications. Discuss SAP's history.  

Q.3 What are “Transactions” in SAP system? What are various help options in SAP?  

Q.4 State the purpose of an organizational element in SAP system. Explain the organizational structure with suitable diagram.
Q.5 Explain how SAP ERP supports key processes in production.

Q.6 Explain what is SAP supply chain management and how it integrates with other components and systems?

Q.7 Outline the tasks associated with SAP ERP Human Capital Management. Also explain the advantages of SAP ERP financials.

Q.8 Differentiate between OLTP and OLAP environment. Discuss the client/server technology developed on the SAP Net weaver application server.

End Semester Examination, May 2016

MCA - Third Semester
Q.1 Explain the following briefly:

a) What are the key traits of an entrepreneur?

b) What are the main motivation factors for an entrepreneur?

c) Discuss proprietorship v/s partnership v/s company form of business.

d) What is meant by ‘Management’ – what are the main functional areas of management?

e) What is ‘Break Even Analysis’?

f) What are the key elements of a project report for S.S.I. unit?

g) Discuss role of banks towards entrepreneurship development.

h) What is the main criteria for locating a business/industry unit?

i) What are technical consultancy organizations?

j) “Entrepreneurship is a risk; you win some, loose some” – Give your comments.

2x10

PART-A

Q.2 Define entrepreneurship. What is the difference between a 1st generation and a 2nd generation entrepreneur? How is an entrepreneur different from a manager?

20
Q.3 What is the role of MSMEs towards economic development of India?  

Q.4 What are the key elements of human resource management within a business organization? Explain.  

**PART-B**

Q.5 If you plan to set up a business unit/company after completing your education, what will be the nature of such business? Write a full business plan for the same.  

Q.6 What are different methods of evaluating a business project? Give details.  

Q.7 What is the overall institutional support available in India for setting up business/industry? Give details of technical and financial support systems available.  

---

End Semester Examination, May 2016

MAC – First Semester
Q.1 a) To apply for a patent, an inventor must:
   i) File an application at a patent office which must comply with formal and technical requirements.
   ii) Demonstrate that their invention works.
   iii) None of the above.

b) Which of the following is not a type of copyright work?
   i) Literary works
   ii) Furniture
   iii) Musical works
   iv) All of the above

c) In computer security, __________ means that the information in a computer system only be accessible for reading by authorized parties.
   i) Confidentiality
   ii) Integrity
   iii) Availability

d) What is internet?
e) What is full form of FTP?
f) What is full form of www?
g) Define ‘data mining’.
h) Define ‘M-Commerce’.
i) Define ‘virtual campus’.
j) Define ‘copyrighting’.

2 × 10
PART-A

Q.2  a) Describe various social and ethical issues in ICT.  
    b) Write a short note on mobile platforms.

Q.3  Write short notes on the following:
      a) Telnet  b) Search Engine
      c) Internet  d) E-mail  

Q.4  a) What is the difference between 3G and 4G?  
      b) Write a short note on E-commerce.  
      c) Write the uses of cloud technology.

PART-B

Q.5  a) What is patent? What are the conditions to be satisfied by an invention to be patentable?  
      b) What is cyber crime? Discuss the various categories of cyber crimes.

Q.6  a) Discuss the various applications of ICT in employment.  
      b) Describe the concepts of biometric technology.

Q.7  a) What are the features of data mining?  
      b) Write a short note on E-banking.

End Semester Examination, May. 2016
MCA - First Semester
DISCRETE STRUCTURES (MCA-102)
Q.1 a) Let \( f, g : R \rightarrow R \) denote functions defined by \( f(x) = 2x + 3 \) and \( g(x) = x^2 \) for every \( x \in R \). Find \( f \circ g \).

b) Show that the mapping \( f : Z^+ \rightarrow Z^+ \) defined by \( f(x) = x^2, x \in Z^+ \), where \( Z^+ \) is the set of integers, is one-one and into mapping.

c) Let \( A = \{1, 2, 3, 4\} \) and \( R = \{(1, 2)(2, 3)(3, 4)(2, 1)\} \). Find the transitive closure of \( R \).

d) Draw the Hasse diagram of \( D_{36} \).

e) If \( H \) is a subgroup of \( G \) then prove that identity element of \( G \) is also the identity element of \( H \).

f) Prove that if \( G \) is abelian group then \( \forall a, b \in G \) and all integers \( n \), \( (ab)^n = a^n b^n \).

g) Draw the complete bipartite graph \( K_{3,2} \).

h) Define acyclic graph with an example.

i) Define finite state automata with an example.

j) Solve the difference equation \( a_r - 3a_{r-1} + 2a_{r-2} = 0 \)

UNIT-I

Q.2 a) Solve the recurrence relation: \( a_n - 4a_{n-1} = 6 \cdot 4^n, a_0 = 1 \)
Q.3  

a) Determine whether the following are equivalent, using biconditional statement:

i) \( p \iff q \equiv (p \land q) \lor (\neg p \land \neg q) \)

ii) \( (p \rightarrow q) \rightarrow t \equiv (p \land \neg q) \rightarrow t \)

b) Consider the set \( A = \{1, 2, 3, 4\} \) and the relation \( R = \{(1, 2), (2, 1), (2, 2), (3, 2), (3, 3), (3, 4), (4, 4)\} \) on set \( A \). Determine \( M^R \) from \( R \).

**UNIT-II**

Q.4  

a) Construct the meet and join table of the lattice \( (L, \lor, \land) \).
Q.5 a) Design a circuit that accepts a 3-bit number and gives output 0 if input represents an even decimal number and gives an output 1 if input represents an odd decimal number.

b) Let $G$ be a group in which $(ab)^i = a^ib^i$ for 3 consecutive integers $i \forall a, b \in G$ then prove that $G$ is abelian.

UNIT-III

Q.6 a) Find a minimum spanning tree of the labeled connected graph below:

b) Find a maximal flow in the network below:
Q.7 Find the shortest path between K and L by using Dijkstra’s Algorithm.

Q.8 Let $M_1$ be a Mealy machine whose transition table is given below:

Find equivalent Moore machine $M_2$
Q.9 Construct deterministic finite state automaton equivalent to the following non-deterministic finite state automaton: $M = (\{0,1\}, \{S_0, S_1\}, S_0, \{S_1\}, f)$, where $f$ is given by the table:

<table>
<thead>
<tr>
<th></th>
<th>$f$</th>
</tr>
</thead>
<tbody>
<tr>
<td>$I$</td>
<td></td>
</tr>
</tbody>
</table>

15
Q.1 a) Let \( f, g : R \to R \) denote functions defined by \( f(x) = 2x + 3 \) and \( g(x) = x^2 \) for every \( x \in R \). Find \( f \circ g \).

b) Show that the mapping \( f : Z^+ \to Z^+ \) defined by \( f(x) = x^2, x \in Z^+ \), where \( Z^+ \) is the set of integers, is one-one and into mapping.

c) Let \( A = \{1, 2, 3, 4\} \) and \( R = \{(1, 2), (2, 3), (3, 4), (2, 1)\} \). Find the transitive closure of \( R \).

d) Draw the Hasse diagram of \( D_{36} \).

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g) Draw the complete bipartite graph \( K_{3,2} \).

h) Define acyclic graph with an example.

i) Define finite state automata with an example.
j) Solve the difference equation \( a_r - 3a_{r-1} + 2a_{r-2} = 0 \).

UNIT-I

Q.2 a) Solve the recurrence relation: \( a_n - 4a_{n-1} = 6 \cdot 4^n, a_0 = 1 \)

b) How many people among 2,00,000 people are born at the same time (hour, minute, seconds)?

Q.3 a) Determine whether the following are equivalent, using biconditional statement:
   i) \( p \iff q \equiv (p \land q) \lor (\neg p \land \neg q) \)
   ii) \( (p \rightarrow q) \rightarrow t \equiv (p \land \neg q) \rightarrow t \)

b) Consider the set \( A = \{1, 2, 3, 4\} \) and the relation \( R = \{(1, 2)(2, 1)(2, 2)(3, 2)(3, 3)(3, 4)(4, 4)\} \) on set \( A \). Determine \( M_R \) from \( R \).

UNIT-II

Q.4 a) Construct the meet and join table of the lattice \((L, \lor, \land)\).
b) Minimize the four variables logic function using K-map:

\[ f(A, B, C, D) = \sum(0, 1, 2, 3, 5, 7, 8, 9, 11, 14) \]

Q.5 a) Design a circuit that accepts a 3-bit number and gives output 0 if input represents an even decimal number and gives an output 1 if input represents an odd decimal number.

b) Let \( G \) be a group in which \( (ab)^i = a^ib^i \) for 3 consecutive integers \( i \) \( \forall a, b \in G \) then prove that \( G \) is abelian.

UNIT-III

Q.6 a) Find a minimum spanning tree of the labeled connected graph below:

![Graph Image]

b) Find a maximal flow in the network below:
Q.7 Find the shortest path between K and L by using Dijkstra’s Algorithm.

UNIT-IV

Q.8 Let $M_1$ be a Mealy machine whose transition table is given below:

<table>
<thead>
<tr>
<th></th>
<th>$f$</th>
<th>$g$</th>
</tr>
</thead>
<tbody>
<tr>
<td>S</td>
<td>0 1</td>
<td>0 1</td>
</tr>
</tbody>
</table>
Find equivalent Moore machine $M_2$

Q.9 Construct deterministic finite state automaton equivalent to the following non deterministic finite state automaton: $M = ([0,1]; \{S_0, S_1\}; \{S_0, S_1\}; f)$, where $f$ is given by the table:

<table>
<thead>
<tr>
<th>$S$</th>
<th>$I$</th>
<th>$f$</th>
</tr>
</thead>
<tbody>
<tr>
<td>$S_0$</td>
<td>0</td>
<td>${S_0, S_1}$</td>
</tr>
<tr>
<td>$S_1$</td>
<td>$\phi$</td>
<td>${S_1}$</td>
</tr>
</tbody>
</table>

15
End Semester Examination, May 2016

MCA – First Semester

PROGRAMMING IN ‘C’ (MCA-103(CB))

Time: 3 hrs Max Marks: 100

No. of pages: 1

Note: Attempt FIVE questions in all; Q.1 is compulsory. Attempt any TWO questions from Part A and TWO questions from Part B. Each question carries equal marks.

Q.1  

a) What is a life?

b) Differentiate between gets( ) and fgets( )?

c) Define pointers.

d) Explain the term: ‘dynamic memory allocation’.

e) Explain the syntax of printf( ) and scanf( ).

f) Why are arrays needed?

g) Define a function. Why they are needed in a program?

h) In which situation a switch case in desirable?

i) What is a ternary operator? Give an example.
j) What is the advantage of using structures?  

**PART-A**

Q.2  
- a) Describe the iterative statements that C language supports in detail.  
- b) What do you understand by scope of a variable? Explain it in detail with suitable examples.

Q.3  
- a) Why does storing of sparse matrices need extra consideration? How are sparse matrices stored efficiently in computer’s memory?  
- b) Write a program to interchange the largest and smallest element of the array.

Q.4  
- a) Write a program to calculate the parking charges of a vehicle. Read the hours and minutes when the vehicle enters the parking lot. When the vehicle is leaving, enter its leaving time? Calculate the difference between the two timings to calculate the number of hours and minutes for which the vehicle was parked. Finally calculate the charges based on the following rules and then display the result on the screen.

<table>
<thead>
<tr>
<th>Vehicle Name</th>
<th>Rate till 3 hours (in `)</th>
<th>Rate After 3 hours (in `)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Truck/Bus</td>
<td>20</td>
<td>30</td>
</tr>
<tr>
<td>Car</td>
<td>10</td>
<td>20</td>
</tr>
<tr>
<td>Cycle/Motorcycle/scooter</td>
<td>5</td>
<td>10</td>
</tr>
</tbody>
</table>

**PART-B**

Q.5 Write a menu driven program to perform various string operations using pointers.

Q.6  
- a) What do you understand by a union? Differentiate between a union and a structure.  
- b) Explain with an example how structures are initialized. How is a structure name different from a structure variable?
Q.7 Explain the different modes in which a file can be opened in C program and under which circumstances the function fopen( ) fail? What is the impact of fclose( ) on buffered data.

20
f) What is cipher-text? Discuss.

g) Name all the layers of OSI reference model.

h) Differentiate between routers and gateways.

i) Write a short note on IP address.

j) Describe briefly multipoint networks.

**PART-A**

Q.2  
   a) Explain the factors that affect the performance and reliability of a network.  
      10

   b) What are the various advantages of distributed processing? Discuss.  
      10

Q.3  
   a) What are the advantages of multipoint connection over a point-to-point connection? 
      Explain.  
      7

   b) Explain the following terms:

      i) Internet.

      ii) Intranet.

      iii) Extranet.  

   c) Explain the merits and demerits of mesh topology.  
      5

Q.4  
   a) Explain the following:

      i) Peer-to-peer processes.

      ii) Interfaces between layers.

      iii) Headers and trailers.  

   b) How do the layers of the TCP/IP protocol suite correlate to the layers of OSI model?  
      8

**PART-B**

Q.5  
   a) What is the function of a router, explain? How does a router decide where an 
      incoming packet should go and also discuss shortest path routing?  
      15

   b) Describe an initial routing table for a distance vector routing.  
      5
Q.6 Explain the following:
   a) File transfer protocol.
   b) Access control.
   c) Packet format of IPv6.
   d) Advantages of IPv6. \(5 \times 4\)

Q.7 a) What do you mean by cryptography? Explain substitution cipher and transposition cipher with an example. \(15\)
   b) Write a short note on data compression. \(5\)

End Semester Examination, May 2016

MCA -First Semester

DIGITAL DESIGN AND COMPUTER ORGANIZATION
(MCA-105(CB))

Time: 3 hrs
Max Marks: 100
No. of pages: 2

Note: Attempt FIVE questions in all; Q.1 is compulsory. Attempt any TWO questions from Part A and TWO questions from Part B. Each question carries equal marks.

Q.1 a) Convert the following octal functions to their decimal equivalents:
   i) \((560)_8\)
   ii) \((0.34)_8\)
b) If a 3-input NOR gate has eight input possibilities how many of those possibilities will result in a high output.

i) 1  ii) 2  iii) 7  iv) 8

c) Evaluate $\overline{A + \overline{BC}}$ using the truth table.

d) The storage element for a static RAM is the ________.

i) diode  ii) resistor  iii) capacitor  iv) flip-flop

e) How is a J-K flip-flop made to toggle?

i) J=0, K=0  ii) J=1, K=0,  iii) J=0, K=1  iv) J=1, K=1

f) How many data select line are required for selecting 8 inputs?

i) 1  ii) 2  iii) 3  iv) 4

g) What is the Boolean expression for the three input AND gate?

i) $X = A + B + C$  ii) $X = A \cdot B \cdot C$

iii) $X = A - B - C$  iv) $X = A \oplus B \oplus C$

h) Which of the following is not a basic Boolean operation?

i) OR  ii) NOT  iii) AND  iv) FOR

i) Which system translate coded character in to a more useful form?

i) encoder  ii) display  iii) counter  iv) decoder

j) The __________ is often referred to as the brain of a computer.

2x10

**PART-A**

Q.2 a) Reduce the following Boolean expression using K-maps.
i) \( f = (A, B, C, D) = \sum (0,1,2,3,4,5,10,11,15) \)

ii) \( f = (x, y, z, w) = \sum (1,3,4,5,7,9,11,12,13,15) \)

b) Draw a circuit to realize the Boolean function

\[ F(A, B, C) = AB + \overline{AC} \]

c) Why NAND and NOR gates are known as universal gates. Explain.

Q.3 a) Evaluate the followings:

i) \[ 1100_{2} - 101_{2} \quad \text{ii)} \quad 1011_{2} + 11_{2} \]

iii) \[ 100110_{2}/110_{2} \quad \text{iv)} \quad (456)_{10} = (?)_{2} \]

b) i) Convert \((359)_{10}\) into it Excess-3 code.

ii) Give the BCD equivalent for the decimal number 509.

c) A 7-bit hamming code is received as 0110110. What is its correct code?

Q.4 a) Write short notes on:

i) Full adder

ii) Multiplexer

b) Explain the 3 to 8 decoder using logic diagram.

PART-B

Q.5 a) Discuss the working principle of synchronous counter with its block diagram. What is the advantage of synchronous counter over serial counter?
b) Differentiate between S-R and J-K flip flop.  

Q.6  
a) What is the function of shift register? Explain different types of shift registers.  


b) What is instruction cycle? What are the steps performed by the CPU during the instruction cycle?  

Q.7  
a) Discuss the various types of addressing modes which are usually provided in microprocessors. Give suitable examples.  


b) Write a short note on: cache memory.
Q.1  Multiple choice questions:

   a) Base 16 refers to which number system:
      i) Binary coded decimal ii) Decimal iii) Octal iv) hexadecimal

   b) The number of bits used to store a BCD digit is:
c) The basic logic gate whose output is the complement of input is the:
   i) OR gate
   ii) AND gate
   iii) INVERTER gate
   iv) Comparator

d) How many address lines are needed to address each memory locations in a 2048X4 memory chip?
   i) 10
   ii) 11
   iii) 8
   iv) 12

e) Which method bypasses the CPU for certain types of data transfer?
   i) Software interrupts
   ii) Interrupt driven I/O
   iii) Polled I/O
   iv) Direct memory access

f) With interrupt driven I/O, if two or more devices request service at the same time:
   i) The device closest to the CPU gets priority
   ii) The device that is fastest gets priority
   iii) The device assigned the highest priority is serviced first
   iv) The system is likely to crash.

g) Interrupts which are initiated by an I/O drive are:
   i) Internal
   ii) External
   iii) Software
   iv) All of the above

h) ________ is the sequence of operation performed by CPU in processing an instruction:
   i) Execute cycle
   ii) Fetch cycle
   iii) Decode cycle
   iv) Instruction cycle

i) In a JK flip-flop the function $K=\bar{J}$ is used to realize:
   i) T flip-flop
   ii) SR flip-flop
iii) D flip-flop       iv) M/S flip-flop

j) Which of the following is not a common word length?
   i) 32        ii) 8
   iii) 16       iv) 12 1½x10

UNIT-I

Q.2 a) Simplify the following using K-map. Also draw the circuit diagram using NAND gates:

a) \( F(A, B, C, D) = \sum (0, 3, 5, 6, 9, 11, 13, 14, 15) \)

\[ D(A, B, C, D) = \sum (1, 2, 8) \]

7½

b) \( F(w, x, y, z) = \Pi (1, 5, 7, 9, 10, 12, 14) \)

7½

Q.3 Write short notes on:

a) Excess-3 code 7½

b) Digital logic gates 7½

UNIT-II

Q.4 What are combinational circuits? Explain the circuit diagram of decodes and multiplexers.

15

Q.5 Explain any two bipolar logic families.

15

UNIT-III

Q.6 What are counters? Explain 4-bit binary counter.

15
Q.7 What are flip-flops? How they help in building a sequential circuit? Discuss master-slave flip-flop.

UNIT-IV

Q.8 Discuss various steps required to execute an instruction with the help of an instruction cycle.

Q.9 a) Explain the various types of interrupts.

b) Write a short note on memory hierarchy.
Q.1 a) Explain the different types of motherboards.
   b) What is the function of mouse?
   c) What is an input port and an output port?
   d) How router works?
   e) Discuss the issues of network security.

   4x5

PART-A
Q.2  
   a) Discuss the components of a motherboard in detail. Write the process of data connection to motherboard and hard disk.  

   b) Explain the disk management technique. Write the steps of formatting and partitioning the hard disks.

Q.3  
   a) What do you understand by ‘peripheral’? Explain with example. Discuss the functions of input and output devices.

   b) Describe the types of printers and their working in detail.

Q.4  
   a) What is USB? How can one install and configure the network printer?

   b) Discuss the mobile and network processors in detail.

PART-B

Q.5  
   a) In how many ways a computer network can be setup? Explain.

   b) Why there is a need of computer networks? Also explain different types of networks.

Q.6  
   a) What are the different aspects of setting up a LAN? Discuss the steps involved in configuring the LAN.

   b) Explain ‘Ethernet’ in detail.

Q.7  
   a) What do you mean by a firewall? How many types of firewalls exist for a network security? Also explain setting up rules, exception, blacklist and white list in firewalls.
b) Explain the following:

i) Antivirus.

ii) Network security.

**End Semester Examination, May 2016**

**MCA - Second Semester**

**PROGRAMMING IN ‘C++’ (MCA-203-CB)**

Time: 3 hrs

Max Marks: 100

No. of pages: 2

Note: Attempt **FIVE** questions in all; **Q.1 is compulsory**. Attempt any **TWO** questions from **Part A** and **TWO** questions from **Part B**. Each question carries equal marks.

Q.1 Multiple choice questions:

a) C++ was originally developed by:

i) Nicolas Wirth  
ii) Donald Knuth

iii) Bjarne Stroustrup  
iv) Ken Thompson

b) What is the purpose of abstract class?

i) to provide help in database connectivity.

ii) to provide data input to other classes.
iii) to provide security to other classes.

iv) to provide an appropriate base class from which other classes will inherit.

c) What is the default visibility mode of members of classes in C++?

i) Private

ii) Public

iii) Protected

Depends

iv) 

d) Which data type is more memory efficient?

i) Structure

ii) Union

iii) Both use same memory

iv) Depends on a programmer.

e) How can we define member function outside the class?

i) Using union

ii) Using structure

iii) Using pointers

iv) Using resolution

f) The major goal of inheritance in C++ is?

i) To facilitate the reusability of code.

ii) To help in modular programming.

iii) To facilitate the conversion of data types.

iv) To extend the capabilities of a class.

g) A class having no public construction is:

i) A public protected class

ii) A public class

iii) A protected class

iv) A private class

h) C++ is a:

i) Procedural programming language.

ii) Structural programming language.

iii) Low level language.
iv) Object oriented programming language.

i) Explicit call to a constructor means?

i) Not providing the constructor name at all.

ii) The shorthand method.

iii) Providing the constructor name explicitly to invoke it.

iv) Providing the constructor name implicitly to invoke it.

j) The objects can directly access:

i) Public members

ii) Private members

iii) Both i) and ii)

iv) None of the above

k) Explain the following terms:

i) Encapsulation

ii) Dynamic binding.

PART-A

Q.2 Explain the basic concepts of object oriented programming.

20

Q.3 a) What are the advantages of function prototypes in C++?

10

b) When will you make a function inline? What is the main advantage of passing arguments by reference?

10

Q.4 a) What is a friend function? What are the merits and demerits of using a friend function?

10

b) How is a member function of a class defined?

10
PART-B

Q.5 Can we have more than one constructor in a class? If yes, explain the need for such a situation. Explain the types of constructors with examples.  

20

Q.6 What are the different forms of inheritance? Give an example of each.  

20

Q.7  

a) What is the basic difference between manipulation and IOS member functions in implementation? Give examples.  

10

b) What are the advantages and disadvantages of using exception handling mechanism in a program?  

10
End Semester Examination, May 2016

MCA - Second Semester

LINEAR ALGEBRA AND STATISTICAL TECHNIQUES (MCA-204)

Time: 3 hrs

Max Marks: 75

No. of pages: 2

Note: Attempt FIVE questions in all; taking at least ONE question from each Unit. Q.1 is compulsory. All questions carry equal marks.

Q.1

a) Show that \( \mathbb{Z} \) w.r.t. + is a group.

b) If \((xy)^2 = x^2 y^2 \forall x, y \in G\) show that \( G \) is abelian group.

c) Define linear combination over field \( F \).

d) Define vector space over the field \( F \).

e) Show that the set: \( \{(1,1,0),(0,1,1),(1,0,-1),(1,1,1)\} \) is linearly dependent.

f) Define idempotent matrix with an example.
g) Find the rank of matrix

\[
A = \begin{bmatrix}
2 & 1 & -1 \\
0 & 3 & -2 \\
2 & 4 & -3
\end{bmatrix}
\]

h) Three coins are tossed simultaneously. What is the probability that at least two tails are obtained.

\[1\frac{1}{2} \times 8\]

i) Explain the algorithm of dual simplex method.

UNIT-I

Q.2 a) Show that:

\[
S = \left\{ \begin{bmatrix} 1 & 2 \\ 2 & -2 \end{bmatrix}, \begin{bmatrix} 0 & -1 \\ -1 & 0 \end{bmatrix}, \begin{bmatrix} 0 & 2 \\ 3 & 1 \end{bmatrix}, \begin{bmatrix} 0 & 0 \\ -1 & 2 \end{bmatrix} \right\}
\]
is a basis for \( M_{22} \).

\[7\]

\[
A = \begin{bmatrix}
1 & 3 & 4 & 2 \\
2 & 4 & 6 & 2 \\
-1 & 5 & 4 & 6
\end{bmatrix}
\]

b) Find the rank of a matrix

\[8\]

\[
A = \begin{bmatrix}
1 & 0 & 2 \\
2 & -1 & 3 \\
4 & 1 & 5
\end{bmatrix}
\]

Q.3 a) Using elementary row transformation, find \( A^{-1} \) if

\[8\]

\[x + y + z = -3\]

\[3x + y - 2z = -2\]

\[2x + 4y + 7z = 7\]

b) Show that the system of linear equations is not consistent.

\[7\]

UNIT-II

Q.4 a) Find the eigen values and the corresponding eigen vectors of the matrix:
Q.5  
   a) Using Cayley-Hamilton theorem, find $A^{-1}$ given the matrix:
   
   $A = \begin{bmatrix} 13 & -3 & 5 \\ 0 & 4 & 0 \\ 15 & 9 & -7 \end{bmatrix}$
   
   b) One of the eigen values of
   
   $\begin{bmatrix} 7 & 4 & -4 \\ 4 & -8 & -1 \\ 4 & -1 & -8 \end{bmatrix}$
   
   is $-9$. Find the other two eigen values.

UNIT-III

Q.6  
   a) Calculate the covariance between height and weight of the following five persons:

   | Height (in cm) | 150 | 148 | 148 | 152 | 154 |
   | Weight (in Kg) | 65  | 64  | 63  | 65  | 67  |

   b) Find the equation of the lines of regression based on the following data:
7

Q.7  

a) Two fair dices are rolled. Find the probability of getting doubles or the sum of 7.

b) Find the standard deviation for the following discrete distribution:

<table>
<thead>
<tr>
<th>X</th>
<th>4</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>4</td>
<td>4</td>
</tr>
</tbody>
</table>

6

UNIT-IV

9

Q.8  

a) Using corner method, solve the following LPP:

Minimize \( z = 8x_1 + 12x_2 \)

Subjected to the constraints:

\[
60x_1 + 30x_2 \leq 240 \\
30x_1 + 60x_2 \leq 300 \\
30x_1 + 180x_2 \leq 540 \\
\text{and } x_1, x_2 \geq 0
\]

b) Use the simplex method to solve the problem:

Maximize \( u = 2x + 3y \)

Subjected to:
Q.9 Solve the following unbalanced transportation problem:

\[-2x + 3y \leq 2\]
\[3x + 2y \leq 5\]
and \(x, y \geq 0\)

<table>
<thead>
<tr>
<th></th>
<th>(D_1)</th>
<th>(D_2)</th>
<th>(D_3)</th>
<th>(D_4)</th>
<th>Supply</th>
</tr>
</thead>
<tbody>
<tr>
<td>(O_1)</td>
<td>20</td>
<td>21</td>
<td>16</td>
<td>18</td>
<td>10</td>
</tr>
<tr>
<td>(O_2)</td>
<td>17</td>
<td>28</td>
<td>14</td>
<td>16</td>
<td>9</td>
</tr>
<tr>
<td>(O_3)</td>
<td>29</td>
<td>23</td>
<td>19</td>
<td>20</td>
<td>7</td>
</tr>
<tr>
<td>Demand</td>
<td>6</td>
<td>10</td>
<td>4</td>
<td>5</td>
<td>—</td>
</tr>
</tbody>
</table>

End Semester Examination, May 2016
MCA - Second Semester
OPERATING SYSTEM (MCA-204-CB)

Time: 3 hrs
Max Marks: 100

No. of pages: 2

Note: Attempt FIVE questions in all; Q.1 is compulsory. Attempt any TWO questions from Part A and TWO questions from Part B. Each question carries equal marks.

Q.1 Fill in the blanks:
a) The operating system that pays more attention on the meeting of the time limits is called __________.
b) __________ is useful when program does not require user intervention.
c) The innermost layer close to hardware is called __________.
d) In __________ mode machine is executing operating system instructions.
e) A thread is sometimes called as a _________ process.
f) __________ operating system supports single user process and single thread.
g) The _________ decides which jobs or processes are to be admitted to the ready queue.
h) A process is _________ if it can affect or be affected by other processes executing in the system.
i) The situation in which a process is waiting for another waiting process may lead to the system in ________ state.
j) In _________ scheme memory is divided into fixed sized blocks called frames and logical memory is divided into fixed sized blocks called pages. 1½x10

k) Define the following:
i) Distributed operating system.
ii) Hashing. 2½x2

PART-A

Q.2  a) Explain in detail the layered approach of an operating system. 12

b) Justify the statement: “operating system acts as a resource manager”. 8

Q.3  What are the various types of schedulers? Explain with the help of a suitable example. 20

Q.4  Write short notes on:
PART-B

Q.5 What are the necessary conditions for a deadlock? Consider the following snapshot of a system:

<table>
<thead>
<tr>
<th>Allocation</th>
<th>Max</th>
<th>Available</th>
</tr>
</thead>
<tbody>
<tr>
<td>A B C D</td>
<td>A B C D</td>
<td>A B C D</td>
</tr>
<tr>
<td>P0 0 0 1 2</td>
<td>0 0 1 2</td>
<td>1 5 2 0</td>
</tr>
<tr>
<td>P1 1 0 0 0</td>
<td>1 7 5 0</td>
<td></td>
</tr>
<tr>
<td>P2 1 3 5 4</td>
<td>2 3 5 6</td>
<td></td>
</tr>
<tr>
<td>P3 0 6 3 2</td>
<td>0 6 5 2</td>
<td></td>
</tr>
<tr>
<td>P4 0 0 1 4</td>
<td>0 6 5 6</td>
<td></td>
</tr>
</tbody>
</table>

Answer the following questions using Banker’s algorithm.

c) What is the content of the matrix need?
d) Is the system in a safe state?

Q.6 a) Explain the difference between internal and external fragmentation.

b) Explain the page replacement algorithm.

Q.7 Write short notes on:

a) Distributed v/s centralized operating system.

b) File access and allocation method.
End Semester Examination, May 2016

MCA -Second Semester

DATABASE SYSTEMS (MCA-205(CB))

Time: 3 hrs

Max Marks: 100

No. of pages: 1

Note: Attempt FIVE questions in all; Q.1 is compulsory. Attempt any TWO questions from Part A and TWO questions from Part B. Each question carries equal marks.
Q.1  a) Differentiate primary key, candidate key and super key with a suitable example.
   b) Explain ACID properties with an example.
   c) What is weak entity set?
   d) Why there is a need of concurrency control?
   e) How can query processing be different from query optimization?

PART-A

Q.2  a) What are problems with traditional file processing system? How they are removed in database system? Explain.

   b) Explain the role of DBA in database.

Q.3  a) How data models help in DBMS? Explain different data models of DBMS with example.

   b) What is meant by ER-diagram? Describe the various attributes and relationship constraints in ER diagram with an example.

Q.4  a) What are DDL and DML commands? Explain with examples.

   b) Consider the relation:
   
   Project (P-no, P-name, Chief-architect)
   Employee (E-no, E-name)
   Assigned_to (P-no, E-no)

   Using SQL evaluate the following:
   i) Obtain details of employee working on project name SYSTEM.
   ii) Get details of employee working on both projects P200 and P300.
iii) Find the number of employee who work on all projects.

PART-B

Q.5  
   a) Differentiate between full and partial dependencies. What is transitive and multi-valued dependency? Explain with the help of an example.

   b) What is normalization of databases? Explain all normal forms with an example.

Q.6  
   a) Why database security is important for an organization? Explain the concept of recovery in brief.

   b) How processing and optimization of query take place in DBMS? What are distributed databases? How transaction management take place in distributed databases?

Q.7  
   What is concurrency control in DBMS? Why it is needed? What are different concurrency control locking techniques in DBMS?
Q.1 Describe the following in detail:

a) Object states and properties.
b) Requirement capture with use case.
c) Control and object flow.
d) Generalization and aggregation.
e) Object creation and destruction.

4x5

PART-A

Q.2 Explain the concepts and benefits of using Object Oriented Methodology using a suitable example. Explain Booch Methodology of OOSE in detail.

20

Q.3 What is UML? Define the building blocks of UML and use case models in detail.

20

Q.4 Explain the elements of an activity diagram using suitable examples. Also describe the advantages of using activity diagrams.

20

PART-B

Q.5 What are access specifications or visibility modes? Explain the types of access specifications with suitable examples along with their usage.

20

Q.6 Differentiate between static and dynamic structural view of an object oriented system. Also discuss the state diagram notations and states in detail.

20

Q.7 Explain the concept and benefits of using sequence diagrams. Draw a sequence diagram for an ATM (Automatic Teller Machine) system.

20
Q.1 Fill in the blanks:

a) The value of Karl Pearson’s coefficient of correlation \((r)\) lies between _______ to _______.

b) Mean of binomial distribution is _______.

c) The most efficient random sampling is _______.

d) In linear programming, objective function and objective constraints are _______.
e) \((H)\) is a sub-group of \((G)\) iff \[\text{__________}\].

f) Define an Abelian group.

g) State consistency theorem.

h) What do you mean by Feasible Region in linear programming problems?

i) Find the Eigen values of the following matrix:

\[
A = \begin{bmatrix} 2 & 1 \\ 1 & -2 \end{bmatrix}
\]

j) What is level of significance in sampling?  

**PART-A**

Q.2  
a) Let \(G\) be a group and \(a^2 = e \forall a \in G\). Prove that \((G)\) is an abelian group.  

b) Find the inverse of the given matrix:

\[
A = \begin{bmatrix} 1 & 2 & -1 \\ 3 & 0 & 2 \\ 4 & -2 & 5 \end{bmatrix}
\]

Q.3  
a) Show that the system:

\[
\begin{align*}
    x + y + z &= -3 \\
    3x + y - 2z &= -2 \\
    2x + 4y + 7z &= 7
\end{align*}
\]

of linear equations is not consistent.  

b) For what values of \((\lambda)\) and \((\mu)\), the system of equations:

\[
\begin{align*}
    x + y + z &= 6 \\
    x + 2y + 3z &= 10 \\
    x + 2y + \lambda z &= \mu
\end{align*}
\]

has i) No solution.  

ii) A unique solution.
Q.4  

a) Verify Cayley Hamilton theorem for the matrix:

\[
A = \begin{bmatrix}
2 & -1 & 1 \\
-1 & 2 & -1 \\
1 & -1 & 2 \\
\end{bmatrix}
\]

and hence find \( A^{-1} \)

b) Diagonalize the matrix:

\[
A = \begin{bmatrix}
1 & 0 & -1 \\
1 & 2 & 1 \\
2 & 2 & 3 \\
\end{bmatrix}
\]

\[PART-B\]

Q.5  

a) Find the equation of the lines of regression based, on the following data:

\[
\begin{align*}
x & : 4 & 2 & 3 & 4 & 2 \\
y & : 2 & 3 & 2 & 4 & 4
\end{align*}
\]

b) Out of 800 family with 5 children each, how many families would be expected to have:

i) Three boys and two girls.

ii) Two boys and three girls.

Q.6  

a) What is sampling? Explain all types of methods for sampling.

b) Two independent samples of sizes (7) and (6) have the following values:

\[
\begin{align*}
\text{Sample A} & : 28 & 30 & 32 & 33 & 33 & 29 & 34 \\
\text{Sample B} & : 29 & 30 & 30 & 24 & 27 & 29
\end{align*}
\]

Examine whether the samples have been drawn from normal populations having the same variance. (Degree of freedom \( F_{0.05} (6, 5) = 4.95 \))
Q.7  
a) Find the maximum of:

\[ z = 4x_1 + 10x_2 \]

Subjected to

\[ 2x_1 + x_2 \leq 50 \]
\[ 2x_1 + 5x_2 \leq 100 \]
\[ 2x_1 + 3x_2 \leq 90 \]

and \[ x_1, x_2 \geq 0 \]

10

b) Find initial basic feasible solution of the following transportation problem by Vogel’s Approximation Method:

<table>
<thead>
<tr>
<th></th>
<th>( D_1 )</th>
<th>( D_2 )</th>
<th>( D_3 )</th>
<th>( D_4 )</th>
<th>Availability</th>
</tr>
</thead>
<tbody>
<tr>
<td>( O_1 )</td>
<td>21</td>
<td>16</td>
<td>25</td>
<td>13</td>
<td>11</td>
</tr>
<tr>
<td>( O_2 )</td>
<td>17</td>
<td>18</td>
<td>14</td>
<td>23</td>
<td>13</td>
</tr>
<tr>
<td>( O_3 )</td>
<td>32</td>
<td>27</td>
<td>18</td>
<td>41</td>
<td>19</td>
</tr>
<tr>
<td>Requirement</td>
<td>6</td>
<td>10</td>
<td>12</td>
<td>15</td>
<td>43</td>
</tr>
</tbody>
</table>

10

**End Semester Examination, May 2016**

**MCA - Third Semester**

**OPERATING SYSTEMS (MCA-301)**

Time: 3 hrs

Max Marks: 75

No. of pages: 2

Note: Attempt FIVE questions in all; taking at least ONE question from each Unit. **Q.1 is compulsory.** All questions carry equal marks.

Q.1  
Multiple choice questions:

a) Which amongst the following is not an advantage of distributed systems?
i) Reliability
ii) Incremental growth

iii) Resource sharing
iv) None of the above

b) Who is called a supervisor of computer activity?

i) CPU
ii) Operating system

iii) Control unit
iv) Application program

c) Interval between the time of submission and completion of the job is called:

i) Waiting time
ii) Turnaround time

iii) Throughput
iv) Response time

d) A scheduler which selects processes from secondary storage device is called:

i) Short term scheduler
ii) Long term scheduler

iii) Medium term scheduler
iv) Process scheduler

e) Memory utilization factor shall be computed as follows:

i) Memory in use/allocated memory
ii) Memory in use/total memory connected

iii) Memory allocated/free existing memory
iv) Memory committed/total memory available

\[ 1\frac{1}{2} \times 5 \]

f) Fill in the blank with the appropriate term:

i) _________ is a non-preemptive scheduling algorithm.

ii) A program in execution is called a _________.

iii) The very high page fault activity is known as _________.

iv) In UNIX, file descriptors are called _________.

v) _______ is a technique that reduces information to a smaller size.

**UNIT-I**

Q.2 Explain the layered approach of O.S. Also discuss in detail the concept of KERNEL and SHELL.

**UNIT-II**

Q.4 What is the average turnaround time for the following processes using?

<table>
<thead>
<tr>
<th>Process</th>
<th>Arrival time</th>
<th>Burst time</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1</td>
<td>0.0</td>
<td>8</td>
</tr>
<tr>
<td>P2</td>
<td>0.4</td>
<td>4</td>
</tr>
<tr>
<td>P3</td>
<td>1.0</td>
<td></td>
</tr>
</tbody>
</table>

15

Q.5 a) What are the properties which a data item should possess to implement a critical section?

b) What is a process? Discuss various states of a process with the help of a process. State transition diagram.
UNIT-III

Q.6 Explain the difference between:

a) Logical and physical address space.

b) Internal and external fragmentation.

c) Paging and segmentation.

Q.7 a) For the reference string: 7, 2, 0, 3, 3, 6, 3, 6, 7, 0, 2, 3 show FIFO replacement algorithm. What is the number of page faults?

b) How is protection affected in segmentation of memory?

UNIT-IV

Q.8 Discuss the following with suitable examples:

a) File attributes.

b) File operations.

c) File types.

Q.9 Explain the various directory structures used in operating system for storing files. Give merits and demerits of all directory structures.
Q.1  a) If in a certain code, LUTE is written as MUTE and FATE is written as GATE, then how will BLUE be written in that code?

b) Complete the series 1, 9, 25, 49, ______, 121.

c) Complete the series 6, 12, 21, ______, 48.
d) Complete the series B2CD, _______ BCD4, B5CD, BC6D.

e) What was the day of week on 15 August, 2015?

f) Nitin ranks 18\textsuperscript{th} in a class of 49 students. What is his rank from the last?

g) Pointing to a photograph of a boy Suresh said, “He is the son of the only son of my mother.” How is Suresh related to that boy?

h) If in a code of alphabet AT = 20, BAT = 40, then CAT = ?

i) If ‘<’ mean ‘minus’, ‘>’ means ‘plus’, ‘=’ means multiplied by and ‘$’ means divided by then what would be the value of 27$\times 81$<6.

j) Select the correct answer from answer figure.

![Problem figure](image)

**PART-A**

Q.2  
\begin{enumerate}
\item a) Complete the series:
\begin{enumerate}
\item ELFA, GLHA, ILJA, _______ MLNA.
\item 3, 10, 101, _______.
\item Z, S, W, O, T, K, Q, G, ?, ?.
\item A, B, D, G, _______.
\end{enumerate}
\item b) Two car starts from the opposite places of a main road 150 km apart, first car runs for 25 km and takes a right turn and then run 15 km. It then turns left and then run for another 25 km and then takes the direction back to reach the main road. In the meantime due to minor break down the other care can run only 35 km along the main road. What would be distance between two cars at this point?
\item c) Acting: Theater : : Gambling : ?
\text{Cricket : BAT : : Hockey : ?}
\end{enumerate}

Q.3  
\begin{enumerate}
\item a) The sum of ages of 5 children born at interval of 3 year in 50 year? What is the age of youngest child?
b) A is two year older then B who is twice as old as C. If the total of the ages of A, B and C be 27, the how old is B?

c) Ram ranks 18th in class of 49 students. What is his rank from the last?

Q.4 a) Choose the missing term:
   i) T, R, P, N, L, ?, ?
      a) J, G b) J, H c) K, H d) K, I
   ii) ADVENTURE, DVENTURE, DVENTUR, _______ VENTU
      a) DVENT b) VENTUR c) DEVNTU 2×2

b) If 1st December is Sunday, then 1st January will be ________.

c) What was the day of week on 15 August, 1947?

PART-B

Q.5 a) Introducing a boy, a girl said. “He is the son of the daughter of the father of my uncle”. How is boy related to the girl?

b) A’s son B is married to C whose sister D is married to E the brother of B. How is D related to A?

c) i) Mango : Fruit : : Potato : ?
     a) Root b) Fruit c) Stem d) Flower
    ii) Dog : Bark : : Goat :?
         b) Bleat b) Howl c) Grunt d) Bray 1½×2

Q.6 a) If ‘+’ means ‘minus’, ‘×’ means ‘divided by’, ‘÷’ means ‘plus’ and ‘-’ means ‘multiplied’ by then what will be the value of expression:

   252 × 9 – 5 + 32 ÷ 92.

b) If 20 – 10 means 200, 8 ÷ 4 means 12, 6 × 2 means 4 then 100 – 10 × 1000 ÷ 1000 + 10 × 10 = ?

c) If ÷ means ×, × means +, + mean –, – means ÷, find the value of 16 × 3 + 5 – 2 ÷ 4.
Q.7  a) Select a figure from the amongst the answer figure which will continue the same series as established by the five problem figure.

Problem figure
<table>
<thead>
<tr>
<th>i</th>
<th>ii</th>
</tr>
</thead>
<tbody>
<tr>
<td>Δ</td>
<td>Δ</td>
</tr>
</tbody>
</table>

Answer figure
<table>
<thead>
<tr>
<th>i</th>
<th>ii</th>
</tr>
</thead>
<tbody>
<tr>
<td>Δ</td>
<td>Δ</td>
</tr>
<tr>
<td>Δ</td>
<td>Δ</td>
</tr>
</tbody>
</table>

3×2

b) Choose the mirror image:

  i) WHITE
  a) EITHW       b) F.ITHW       c) F.IHMT       d) ETIHW
  ii) 6
  b) g            b)  d            c) e            d)  d  2×2

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End Semester Examination, May 2016
MCA – Third Semester
WEB APPLICATION AND E-COMMERCE (MCA-302)

Time: 3 hrs  Max Marks: 75
No. of pages: 1

Note: Attempt FIVE questions in all; taking at least ONE question from each UNIT. Q.1 is compulsory. All questions carry equal marks.

Q.1  a) A homepage is ____________.

b) Bookmarks or favorite fields are primarily used for ____________.

c) ____________ language is used to embed image in a web page.

d) ____________ is a personal journal posted on the web for access by the public.
e) The primary purpose of arraymap( ) function is:

i) Maps the elements of another array into itself.

ii) Passes each element of the array and returns the necessary mapped elements.

iii) Passes each element of the array on which it is invoked to function you specify and return an array containing the values returned by that function.

iv) None of the above.

f) What term refers to the small webpage that opens automatically with an advertisement when we visit some websites?

g) The method operator used to identify the array is:

i) array types( )

ii) = =

iii) = = =

iv) typeof

h) What is an ISP?

i) JavaScript is ___________ side scripting language.

j) What does EDI stand for? 1½×10

UNIT-I

Q.2 Write short notes on:

a) Bulletin board system

b) WWW

c) Telnet and FTP 5×3

Q.3 a) How frames are created in HTML? Explain with an example. 10

b) Write a short note on Photoshop. 5

UNIT-II

Q.4 a) Explain on_click and on_load events in detail. 10

b) Explain dynamic HTML. 5

Q.5 a) Differentiate between external and internal style sheets. 10
b) What are the various formatting styles in CSS?

**UNIT-III**

Q.6 Explain the following DOM objects:

a) Windows Navigator
b) History
c) Location

**UNIT-IV**

Q.7 Explain various data functions, math functions and string functions in JavaScript.

Q.8 a) Explain ASP object Model describing various objects in detail.

Q.9 Write short notes on:

a) Risks in a payment system
b) Digital signatures
c) Security issues in e-commerce
Q.1 Fill in the blanks:

a) HTTP stands for __________.

b) In PHP, each statement must end with __________.

c) The CSS property which control text size is __________.
d) The C in CSS stands for __________.

**Multiple choice questions:**

e) Which of the following is not a predefined variable?
   
   i) $ get
   
   iii) $ request
   
   i) $ ask
   
   iv) $ point

f) Mechanism to protect private networks from outside attack is:
   
   i) Firewall
   
   iii) Antivirus
   
   ii) Formatting
   
   iv) Digital signature

**Answer the following:**

g) Is this correct syntax to include JS codes inside HTML page?

   <Script type = "Text/JavaScript">L/Script)

h) Define home page.

i) What type of commerce is enabled by technology?

j) A table can be created without specifying primary key. (True/False)

**UNIT-I**

Q.2 Write short notes on:
   
a) SMTP
   
b) URL
   
c) Gopher

Q.3 a) Create a railway reservation table in HTML using all the attributes of table.
   
b) How are the images designed in HTML?

**UNIT-II**

Q.4 Differentiate between internal, external and inline style sheets.

Q.5 a) Create a program in JavaScript using mouse-over function.

UNIT-III

Q.6 Explain ifelse and switch statement in JavaScript using appropriate examples.

Q.7 Create an admission form in VBScript using different controls.

UNIT-IV

Q.8 What is digital signature and its significance? Differentiate between digital signature and electronic signature.

Q.9 Explain e-commerce with its types. Also write its advantages and disadvantages in detail.

End Semester Examination, May 2016

MCA – Third Semester

DATA STRUCTURES (MCA-303 (CB))

Time: 3 hrs
Max Marks: 100
No. of pages: 2

Note: Attempt FIVE questions in all; Q.1 is compulsory. Attempt any TWO questions from Part A and TWO questions from Part B. Each question carries equal marks.

Q.1 Multiple choice questions:

a) The situation when in a linked list START = NULL is __________.
   i) Underflow   ii) Overflow   iii) None of these.

b) The term push and pop is related to:
   i) Stack   ii) Queue   iii) None of these.
c) We can traverse in either direction:
   i) Singly linked list.  
   ii) Circular linked list.  
   iii) Doubly linked list.  
   iv) None of these.

d) A technique for direct search is:
   i) Binary search.  
   ii) Linear search.  
   iii) Trace search.  
   iv) Hashing

e) A linear list of elements in which deletion can be done from one end and insertion can take place only at the other end is _________.
   i) Stack  
   ii) Queue  
   iii) Tree  
   iv) None of these.

State whether TRUE or FALSE:

f) LIFO (Last-in First-out) is used in queue.
g) B-trees are generally very deep and narrow.
h) When in-order traversing a tree resulted EACKFHBG, the preorder traversal would return FEAKDCHBG.
i) The memory address of the first element of an array is called first address.
j) Queue is a non-linear data structure.  

Answer the following:

k) Define graph.
l) Define binary tree.
m) Define linked list.
n) Define hashing.
o) Define traversing.

PART-A

Q.2   a) Suppose A is two-dimensional array with 20 rows and 4 columns. Each element of the array is stored in 4 memory locations. If base address is 500, find the address of A[14, 2] using row-major order and column-major order.

b) Write the Binary Search Algorithm to search a particular element in the list.
Q.3  a) Define a 'stack'. Discuss the various operations of a stack. Write an algorithm to evaluate the postfix-notation.  
    
    b) Explain the drawbacks of linear queue. How these drawbacks can be overcome? Explain with an example.  
    
    c) Write a short note on 'Deque'.  

Q.4  a) What are the advantages of linked list? How linked lists can be used for polynomial manipulation? Discuss with a suitable example.  

    b) Write an algorithm to insert a new element after a given node in a linked list.  

    c) Give the difference between an Array and a linked list.  

PART-B

Q.5  What is binary search tree? Write an algorithm to insert a new element in the binary search tree. Construct the binary search tree for the following data:

    40, 60, 50, 33, 55, 11. Show each step.  

Q.6  Explain various graph traversal techniques in detail. Give the algorithm of each technique with example.  

Q.7  a) Using linear probing and quadratic probing, insert the following values in a hash table of size 10:

    99, 33, 23, 44, 56, 43, 19

    Also show how many collisions occur in each technique.  

    b) Discuss the various factors affecting choice of file organization.  

    c) Define: Sequential file organization.
Q.1 Fill in the blanks:

a) There are ________ types of projections.

b) ________ transformation changes the axes of an object.

c) Rubber band method include in ________ technique.

d) Light pen is an________ device.

e) LCD stands for ________.
f) CRT stands for _________.

g) The image is passed repeatedly to the monitor ________ times in order to maintain a steady picture on the screen.

h) Scaling means ________ of object.

i) Mirror reflection gives exact ________ of an object.

j) A many sided figure termed as _________.

1×10

Explain the following in brief:

k) Two Dimensional object.

l) Frame Buffer.

m) Boundary fill Algorithm.

n) Graphical User Interface.

o) Colour Monitor.

2×5

PART-A

Q.2 a) Differentiate between CRT and DVST. 10

b) Explain the mechanism to generate the colours in a monitor. 10

Q.3 a) Explain DDA for line drawing with the help of an example. 10

b) Explain the following terms in brief:

i) Grid.  
   ii) Gravity field.

   iii) Sketching  
   iv) Dragging

   v) Inking.  

2×5

Q.4 a) Explain the properties of Bezier Curve in detail. 10

b) What is the importance of seed-fill algorithm? Explain it in detail. 10

PART-B

Q.5 a) What do you mean by a projection? Explain in detail. 10
b) What would be new points of a unit cube if it is scaled by twice of its size in x axis; half of its size in z axis and y remain as it is?  

Q.6 a) Explain Cohen Sutherland line clipping algorithm with an example.  
   b) Explain 2-D viewing pipeline in detail.  

Q.7 a) What do you mean by a hidden surface? How can one detect and remove the hidden surface? Explain.  
   b) Write an algorithm for back face detection.
b) The process of planning your multimedia presentation is known as:
   i) Design
   ii) Storyboard layout
   iii) Development         iv) None of these

c) The animation can be divided into:
   i) One part
   ii) Two part
   iii) Three part         iv) Four part

d) Z-Buffer algorithm are
   i) Simplest algorithm     ii) Complex algorithm
   iii) Largest algorithm    iv) None of these

e) The shape of Bezier Curve primarily depends upon the:
   i) Position of control points
   ii) Distance of control points
   iii) Position of control panel
   iv) None of these

f) In orthographic projection, engineering use:
   i) Top view of object
   ii) Front view of object
   iii) Side view of object
   iv) All of these

g) A pixel may be defined as:
   i) Smallest size object
   ii) Largest size object
   iii) Medium size object
   iv) None of these

h) Some common form of clipping include:
   i) Curve clipping
   ii) Point clipping
   iii) Polygon clipping
   iv) All of these

i) A wireless mouse work on:
   i) Infra blue radiation
   ii) Infra red radiation
   iii) Infra green radiation
   iv) None of these

j) A graphics tablet works on same principal as:
i) Light pen
ii) Monitor
iii) Projector

None

UNIT-I

Q.2 What are the primary component of CRT? Explain the working of CRT.

15

Q.3 Differentiate following:

a) Random scan and raster scan.
b) Zooming and panning.
c) CUI and GUI.

5x3

UNIT-II

Q.4 a) Find the transformation that scales (w.r.t origin) by:

i) a units in \( x \) direction.

ii) b units in \( y \) direction.

iii) Simultaneously a units in \( x \) direction and b units in \( y \) direction.

9

b) What are the conditions to smoothly join curve segment? What is the convex hull property of Bezier curve?

6

Q.5 a) Explain the Cohen Sutherland algorithm for line segment clipping.

7

b) Draw a line between (1, 1) and (7, 5) using Bresenhem’s line drawing algorithm.

8

UNIT-III
Q.6 Derive transformation matrix to scale a unit cube twice uniformly w.r.t. origin. Find the co-ordinates of transformed cube.  

15

Q.7 a) Write Z-buffer algorithm for back face removal.  

7

b) What do you mean by keyframing, tweening and morphing? Explain different applications of animation.  

8

UNIT-IV

Q.8 a) Explain the minimum hardware requirement for multimedia.  

5

b) What do you mean by MIDI message? Explain the concept of MIDI hardware in detail.  

10

Q.9 a) What do you mean by compression? Explain in detail.  

10

b) Explain different types of image formats in detail.  

5
Q.1 Multiple choice questions:

a) Which registers can interact with the secondary storage?
   i) MAR   ii) PC   iii) IR   iv) RO

b) For a R-S-Flip Flop constructed with NAND gate and input R = 1 and S = 1 the state is:
   i) Memory   ii) Set>   iii) Reset   iv) Unused

c) Which of the following bus is used to transfer data from main memory to peripheral device?
   i) DMA Bus   ii) Output Bus   iii) Data Bus   iv) All of the above.
d) ________ digital circuit perform reverse operation of decoder.
   i) Multiplexes ii) Adder iii) Subtractor iv) Encoder

e) In immediate addressing the operand is placed in:
   i) CPU register ii) After opcode iii) Memory iv) Stack

Answer in brief:
f) Convert \((101011)_2 = (?)_{16}\).
g) What is the benefit of K-map?
h) What is the format of instruction?
   i) What is number system?
j) What do you mean by register?

PART-A

Q.2 a) Convert:
   i) \((111011011)_2 = (?)_{16}\).
   ii) \((756.76)_{10} = (?)_8\).
   iii) \((7A.5E)_{16} = (?)_2\).
   iv) \((85.67)_{10} = (?)_{16}\).
   v) \((10110.11)_2 = (?)_8\).

b) Differentiate between encoder and decoder. Explain with the help of a block diagram.

Q.3 Explain instruction cycle with the help of an example.

Q.4 Explain the following:
a) General register organization.
b) Stack organization.
c) Input output instruction.
d) Memory reference instruction. 5×4

PART-B

Q.5 Differentiate the following:

a) Memory reference VS I/O reference instruction.

b) RISC and CISC

c) Isolated VS memory mapped I/O.

d) Cache VS virtual memory. 5×4

Q.6 Explain the working of DMA in detail. 20

Q.7 a) Explain page replacement with an example. 10

b) Explain booth’s multiplication algorithm with a suitable example. 10
Q.1 a) Which of the following are attributes of font tag?
   i) Size     ii) Face     iii) Colour     iv) All of the above

b) Which tag is used for arranging the tags in paragraphs?
   i) <par>       ii) <paragraph>   iii) <p>       iv) <a>

c) Which attribute one will use with TD tag to merge two cells horizontally?
   i) Merge = colspan2   ii) Rowspan = 2   iii) Colspan = 2   iv) merge = row 2

d) Which CSS property is used to change the text colour of an element?
   i) Font-Colour   ii) fg colour   iii) Text-colour   iv) Colour
e) PHP is _____________ language.
   i) Sever side   ii) Client side   iii) Middle side   iv) Outside

f) Which of the following is not the scope of variable in PHP?
   i) Local       ii) Global       iii) Static       iv) External

g) In PHP, variables are case sensitive.
   i) True       ii) False

h) In PHP, each statement must be end with
   i) . (Dot)  ii) ; (Semicolon) iii) / (Slash) iv) : (Colon)

i) PHP stands for:
   i) PHP: Hypertext processor.
   ii) PHP: Hypertext Preprocessor.
   iii) PHP: Hyper Markup Preprocessor.
   iv) PHP: Hyper Markup processor.

j) Which of the following statements prints in PHP?
   i) Out ii) Right iii) Echo iv) Display

k) It is possible to display pictures in HTML specification by using the tag.
   i) <GR src = Picture file>
   ii) <Pic src = Picture file>
   iii) <Img src = Picture file>
   iv) <GIF src = Picture file>

l) A webpage is located using a:
   i) Universal Record Linking.
   ii) Uniform Resource Locator.
   iii) Universal Record Locator.
   iv) Uniformly Reachable Links.  \[1\frac{1}{2} \times 12\]

m) Write down few features of PHP.  2
PART-A

Q.2  a) How tables are created in HTML? Draw a railway reservation table using all the attributes.  
     b) What do you mean by FRAME? How these can be created in webpage?  

Q.3  a) Differentiate ID and class with suitable examples.  
     b) Differentiate internal and external style-sheets with suitable examples.  

Q.4  a) What are the various data-types in PHP? Explain using suitable examples.  
     b) Explain IF, IF-else and switch statement in PHP through examples.  

PART-B

Q.5  a) What are the scopes of variables in PHP? Differentiate in detail using examples.  
     b) What are the functions of TRV, CATCH and THROW commands? Explain with examples.  

Q.6  a) Write a program in JavaScript to swap the two images using on mouse over event.  
     b) What are various control structures in JavaScript? Explain.  

Q.7  a) What is MySQL? What are the features of MySQL?  
     b) Write the function of use and show command in MySQL.  
     c) What are the various joins in MySQL? Explain with examples.
Q.1  
   a) What are the minimum hardware requirements for installing UNIX?  
   b) What does the block size signify?  
   c) Write a command in UNIX to search all lines in a file which do not end with a semicolon.  
   d) Construct a pipeline to list all files beginning with the character ’p’ on the screen and also store them in a file called ‘file 1’.  
   e) Display list of last 20 files present in the current directory. Also store this list in a file.  
   f) Can we change the nice value of a process which is already present in memory?  
   g) What do you mean by daemon in unix?  
   h) How can one mail a letter to 5 different users through one command?  
   i) How will you use positional parameters and special parameters in shell programming?  
   j) What is the difference between absolute path and relative path?  

2×10
**PART-A**

Q.2 Describe the meaning of portability. Which security mechanisms are available in UNIX? Also password ageing.  

Q.3 What is a user mask or file creation mask? What are the system default permissions for newly created files and directories? What is the command to set user mask? Is it possible to have multiple permission sets for a file or directory? Explain your answer.  

Q.4 a) What do you mean by a filter? Give examples of filters.  

b) Construct pipelines to carryout following jobs:  

   i) List all files beginning with the character ‘R’ on the screen twice in succession.  

   ii) Output of ‘who’ should be sorted and displayed on the screen along with total number of users. The same output except the number of users should also be stored in a file ‘file 1’.  

   iii) Merge contents of files a.text, b.text and c.text, sort them and display sorted output on the screen page by page.  

**PART-B**

Q.5 A shell script can receive an argument ‘one’, ‘two’ or ‘three’. If the argument supplied is ‘one’ display it is bold, if it is ‘two’ display it in reverse video and if it is ‘three’ make it blink on the screen. If a wrong argument is supplied report it. Use an elif or switch statement.  

Q.6 What will be output of following program segments?  

  a) n = “ask me”  

     echo $n  

     echo “$n”  

     echo ‘$n’  

  b) (date; echo hello) > message  

  c) Set shadow of Ignorance echo “$*”  

     echo “$@”
Q.7 Discuss the following:

a) Elementary TCP sockets.

b) Elementary UDP socket.
Q.1 a) ______ and ________ are data types available in visual basic.
   b) ______ and ________ are container controls available in visual basic.
   c) The static variables are always declared ________.
   d) ______ is an event attached with the textbox in visual basic.
   e) A listbox has ______ property.
   f) ______ appears on the left side of the screen in visual basic.
   g) ________ and ________ are the conditional statements available in visual basic.
   h) An array in visual basic is declared as ________.
   i) OLE stands for ________.
   j) ________ box provides a set of choices to the user.

   $1\frac{1}{2}\times10$

UNIT-I
Q.2 Compare and contrast the procedural programming language with an event driven language.

15

Q.3 Explain the following terms:
   a) Client area.
   5
   b) Properties window.
   5
   c) Code window.
   5

UNIT-II

Q.4 a) Explain five important properties of a Textbox in VB.
   5
   b) Differentiate the following:
      i) Listbox and Combobox.
      ii) Textbox and Label.
      5x2

Q.5 Explain the difference between a general procedure and an event procedure with the help of an example.

15

UNIT-III

Q.6 What is an array? What is the need of an array? Explain the advantages and disadvantages of using an array in VB.

15

Q.7 Write short notes on:
   a) Operators in VB.
   b) Conditional statements in VB.
   7\frac{1}{2}x2
UNIT-IV

Q.8 Explain the following terms:
   a) Structured query language (SQL).
   b) Bound data controls.  7½x2

Q.9 Explain in detail the steps required in creating a data report in VB.  15
End Semester Examination, May 2016

MCA - Fourth Semester

OBJECT ORIENTED PROGRAMMING IN JAVA (MCA-402(CB))

Time: 3 hrs

Max Marks: 100

No. of pages: 1

Note: Attempt FIVE questions in all; Q.1 is compulsory. Attempt any TWO questions from Part A and TWO questions from Part B. Each question carries equal marks.

Q.1 Describe the following in detail:

a) Java source file structure.
b) Basic features of Java.
c) Overriding super class methods.
d) Types of exceptions in Java.
e) Java applets.

PART-A

Q.2 Discuss the usage of JVM in Java. Also explain the basic features and benefits of Java program development environment.
Q.3 Explain the following:
   a) Constructors in Java.
   b) Garbage collection.
   c) Primitives data types in JAVA.
   d) Abstract classes.  

Q.4 Explain the following with suitable examples:
   a) Role of constructors in inheritance in Java.  

Q.5 Define usage of packages as access protection in Java. Explain naming conventions and CLASSPATH settings for packages in detail. 

Q.6 What is the need of multi-threading programming? Explain the thread life cycle. Discuss the priorities, synchronization and intercommunication of threads in JAVA. 

Q.7 Briefly describe the following:
   a) Types of JDBC connectivity.
   b) JSP scripting and file inclusion.
c) POST and GET requests.

d) Servlet configuration and implementation.

20
End Semester Examination, May 2016

MCA – Fourth Semester

SOFTWARE ENGINEERING AND TESTING (MCA-403(CB))

Time: 3 hrs Max Marks: 100

No. of pages: 1

Note: Attempt FIVE questions in all; Q.1 is compulsory. Attempt any TWO questions from Part A and TWO questions from Part B. Each question carries equal marks.

Q.1 Fill in the blanks:

a) Software consists of __________.

b) Concept of software engineering is applicable to __________.

c) SRS stands for __________.

d) Waterfall model is not suitable for __________.

e) Function count method was developed by __________.

f) The most desirable form of cohesion is __________.

g) A system that does not interact with external environment is called __________.

h) For a function of \( n \) variables, boundary value analysis yields __________ test cases.

i) Cause effect graphing is one form of __________.

j) CMM stands for __________.

PART-A

Q.2 a) “The software crisis is aggravated by the progress in hardware technology”. Justify your answer by listing various other factors for the software crisis. 15

b) What is software engineering? Is it an art, craft or science? Discuss. 5
Q.3 Assume that size of an organic software product is estimated to be 25,000 LOC. Determine the efforts required to develop software product, development time, average staff size and productivity using basic model of COCOMO.

Q.4 What is modularity? Explain all types of coupling in detail. What types of problems arise if two modules have high coupling?

**PART-B**

Q.5 a) Testing is an umbrella activity. Justify your answer with a suitable example.

b) Draw a neat diagram for testing cycle and also explain its different phases.

Q.6 A program computes $a^b$ where $a$ lies in the range [1, 10] and $b$ with in [1, 5]. Design test cases for these using boundary value analysis and robust testing.

Q.7 What is software quality? Discuss software quality attributes in detail.

End Semester Examination, May 2016
MCA – Fourth Semester

ARTIFICIAL INTELLIGENCE (MCA-404(CB))

Time: 3 hrs Max Marks: 100
No. of pages: 1

Note: Attempt FIVE questions in all; Q.1 is compulsory. Attempt any TWO questions from Part A and TWO questions from Part B. Each question carries equal marks.

Q.1 a) What are the types of transition networks in natural language processing?
   b) What is a Skolem function?
   c) Give an example of a heuristic function.
   d) What is alpha and beta cut-off in game playing?
   e) List Artificial Intelligence task domains.

State true or false:

   f) Best first search is a kind of blind search.
   g) Unification is a deduction technique.
   h) Neurons are known as simple processors.
   i) MYCIN is an expert system, which diagnoses brain diseases.
   j) Experimental errors are major sources of uncertainty.

Fill in the blanks:

   k) A __________ technique improves the efficiency of search process.
   l) Mini-max is complete if the tree is __________.
   m) Fuzzy logic allows value between __________ and __________.
   n) The types of knowledge used in Artificial Intelligence System are __________ and __________.
   o) In semantic net, knowledge is represented as __________.
PART-A

Q.2    a) Describe the Turing Test and write the criticism it faced.  

b) Discuss different Artificial Intelligence task domain in detail.

Q.3  Consider the following tree:

```
    A
   / \    
  B   C
 / \   /   
D  E  F  G
     /     / 
    I     J  K
```

Trace the goal L using depth first search technique.

Q.4 How will you convert a predicate into clausal form? Discuss all the steps by taking suitable examples.

PART-B

Q.5    a) What is the difference between non-monotonic reasoning and probabilistic reasoning?

b) What is a Bayesian Probabilistic Network? Discuss with example.

Q.6  What are the fundamental problems in using NLP based system? What are the applications of natural language processing?

Q.7    a) What are advantages and disadvantages of neural networks?

b) Draw and discuss basic neuron model.

End Semester Examination, May 2016
Q.1 Choose the correct option for the following:

a) The FROM SQL clause is used to:
   i) Specify search condition.
   ii) Specify range for search condition.
   iii) Specify the table we are selecting or deleting data from.

b) Which of the following SQL clause is used to enter data into SQL table?
   i) Select
   ii) Insert
   iii) Enter
   iv) Write

c) Which of the following SQL clauses is used to select data from two or more tables?
   i) Join
   ii) Having
   iii) Where
   iv) None of the above

d) DML is a language that allows:
   i) To define data relationships
   ii) To define the
   iii) To add new rows
   iv) All of the above

e) Which of the following is a variable attributes?
i) % rowtype       ii) % row count
iii) % count       iv) None of the above
of the above

f) Exception can be declared in the:
i) Begin          ii) Declarative
iii) Anywhere in the PL/SQL block   iv) None of the above

g) Pragma means the statement runs at:
i) Runtime      ii) Compile time
iii) Both i) and ii)      iv) None of these

h) Which of the following statement requires an explicit cursor if processing more than one row?
i) Select       ii) Update
iii) Delete       iv) Insert

i) TCL stands for:
i) Transaction control language   ii) Transaction command language
iii) Transaction connect language   iv) None of the above

j) Which command is used to add the views to the database?
i) Database view   ii) Create view
iii) Create option   iv) None of these

UNIT-I

Q.2 What do you mean by normalization? Explain the anomalies, which are removed through normalization with suitable examples. Define fourth and fifth normal form. Why is 5 NF also called PJNF? Explain.

1½ x 10

Q.3 Explain the following:
UNIT-II

Q.4 Explain the following in SQL:
   a) Various constraints with examples.
   b) Significance of group by clause with examples.
   c) Difference between UNION and Intersection.

Q.5 Explain any 10 SQL functions with suitable examples.

UNIT-III

Q.6 What do you mean by cursor? Discuss the usage and working of cursors? Explain with an example.

Q.7 Discuss the following:
   a) Actual and formal parameters.
   b) Syntax for creating a trigger (with an example).
   c) Explicit and implicit exception (with a example).

UNIT-IV

Q.8 What are master detail reports? Explain all types of reports and also write down the steps to create reports.

Q.9 Explain the following:
a) LOVs
b) Alerts.
c) Formulas.

End Semester Examination, May 2016
Q.1 Answer the following:

a) Expand the equation \( x^6 + x^4 + x^3 + x + 1 \)

b) Define three types of transmission modes.

c) Discuss the merits and demerits of mesh topology.

d) List all the layers of TCP/IP model.

e) What are the responsibilities of session layer? Discuss.

f) Explain the difference between analog signal and digital signal.

g) How does NRZ-L differ from NRZ-I? Explain.

h) Name the three major classes of guided media.

i) How does FDM combine multiple signals into one? Explain.

j) Explain how does a single bit error differ from a burst error. \( 2 \times 10 \)

PART-A

Q.2 a) What criterias are required for an effective and efficient network? Discuss the factors that affect the performance of a network. \( 10 \)

b) Discuss the various components of data communication. Explain the advantages of a multipoint connection over a point-to-point connection. \( 10 \)

Q.3 a) Assume data stream is made of ten alternating 0s and 1s. Encode this stream using the following encoding schemes.
i) Unipolar  
ii) RZ  
iii) AMI 

iv) Manchester  
v) Differential Manchester

b) Differentiate between shielded twisted pair and unshielded twisted pair.  

Q.4  
a) List the responsibilities of data link layer and presentation layer.  

b) Explain the following:  
i) Peer-to-peer processes.  
ii) Interfaces between layer.  
iii) Flow control. 

PART-B

Q.5  
a) Discuss the main functions of data link layer and the mechanism of ENQ/ACQ and Poll/select.  

b) Find the LRC for the following block of data:  

10011001 01101111

Q.6  
a) Given a 6-bit sequence 100100 and a divisor of 1101, find the CRC and if error detection bits are generated, check the received frame for transmission error.  

b) Explain the difference between TCP and UDP protocol. 

Q.7  
a) Explain the concept of token ring. What will happen if the token is lost? Also explain the frame format of token ring.  

b) Explain the following:  
i) Frame format of token bus.  
ii) Congestion control. 

End Semester Examination, May 2016
Q.1  Answer in one line only:
   a) State the five goals of network security.
   b) What is the full form of virus?
   c) Give one example of network spoofing.
   d) Name three defense models.
   e) Differentiate between active and passive attacks.

Fill in the blanks:
   f) The two algorithms of primality testing are ________ and ________.
   g) Two examples of stream cipher are ________ and ________.
   h) PKI stands for ________.
   i) Examples of hash function is ________.
   j) Three common algebraic structures are ________.

UNIT-I
Q.2  a) What are trojaus? Give examples of at least one commonly known trojaus.  
     b) Differentiate between worm and viruses.
Q.3 Write short notes on the following:

a) Firewalls

b) Data integrity

c) Need for security

UNIT-II

Q.4 a) What do you understand by certificate based authentication? Explain the steps involved with a suitable diagram.

b) Define access control. Give and explain real life examples of any two physical intrusion detection systems.

Q.5 How is kerberos designed to provide strong authentication for client/server applications by using secret key cryptography? Also mention the short comings of kerberos.

UNIT-III

Q.6 Differentiate between plain text and cipher text. Define various encryption techniques. Explain the traditional methods of data encryption with suitable examples.

Q.7 Discuss the following with suitable examples:

a) Message digests.

b) Hash function.

c) Message integrity and digital signature.

UNIT-IV

Q.8 Find all solutions to each of the following linear equations:

a) \[-4x = 4 \pmod{6}\]

b) \[-9x + 4 = 12 \pmod{7}\]
Q.9 Find value of $x$ for the following set of congruence using Chinese reminder theorem:

a) \[-x = 2 \mod 7 \quad \text{and} \quad x = 3 \mod 9\]

b) \[-x = 7 \mod 13 \quad \text{and} \quad x = 11 \mod 12\]
Q.1 Multiple choice questions:

a) Amazon web service is which type of cloud computing distribution model?
   i) SaaS   ii) PaaS
   iii) IaaS   iv) Cloud on demand

b) What is private cloud?
   i) A standard cloud service offered via the internet.
   ii) A cloud architecture maintained within an enterprise data centre.
   iii) A cloud service inaccessible to anyone but the cultural elite.
   iv) Cloud servers.

c) What are the two main sections of a cloud computing system?
   i) Terminals and nodes.
   ii) Front end and back end.
   iii) Networks and servers.
   iv) Client and server.

d) Which of the following service provider provides the least amount of built in security?
   i) IaaS   ii) PaaS
   iii) SaaS   iv) All of the above

e) “Cloud” in cloud computing represents what?
   i) Wireless   ii) Hard drives
iii) People iv) Internet

f) Which of these should a company consider before implementing cloud computing technology?

i) Employee satisfaction ii) Potential cost reduction

iii) Information sensitivity iv) All of the above

State whether TRUE or FALSE:

g) Access to a cloud environment always cost more money compared to a traditional desktop environment.

h) Google Docs is a type of cloud computing service:

Fill in the blanks:

i) The two essential concepts of cloud computing are __________ and __________.

j) VIM is a management tool of __________. 2×10

PART-A

Q.2  a) What is cloud computing? Explain the various layers of cloud computing with suitable examples? What is the importance of cloud computing for small organizations? 12

b) Explain the following industry platforms related to cloud:

i) Microsoft Azure.

ii) Hadoop. 4×2

Q.3  What do you understand by grid computing? How is grid different from a cloud? Also differentiate between grid computing and cloud computing by mentioning the advantages and drawbacks of both. 20

Q.4  a) Which is the most common scenario of a private cloud? Explain. 6

b) Describe the storage architecture implemented in Aneka. 7

c) Give the detail about the basic approach to a data centre based SOA. 7

PART-B
Q.5 What is the use of onion encryption layer in cloud computing? How is it useful in maintaining trust and reputation in cloud computing? Differentiate between HOM and FPE.

Q.6 Write short notes on:
   a) Grid platforms.
   b) Emerging cloud software environments.
   c) Parallel programming paradigms.
   d) Programming on Amazon AWS.

Q.7 Explain the following in relation to moving applications to clouds:
   a) Cloud bursting.
   b) System abstraction.
   c) Application attributes.
   d) Functionality mapping.

End Semester Examination, May 2016
MCA - Fourth Semester
Q.1 Write full form of:
   a) NSS  
   b) GSM  
   c) ISDN  
   d) MMS  
   e) PSTN  
   f) BSC  
   g) PIN  
   h) MS  
   i) EIR  
   j) WI_FI  
   2x10

PART-A

Q.2 Explain the GSM architecture with a diagram. Also explain the various GSM entities in detail.
   20

Q.3 a) Differentiate between adhoc and infrastructure based wireless network.
   10
   
   b) “We cannot live without our mobiles in today’s era.” Justify this statement by giving relevant examples in context to entertainment, communication and usefulness for day to day activities.
   10

Q.4 a) Explain the working of virtual private network (VPN).
   10
   
   b) Explain the concept and usefulness of WAP push architecture.
   10

PART-B
Q.5 Write short notes on:

a) Security issues in adhoc networks.

b) Five applications of adhoc networks.

c) Bluetooth security.

d) Mobile IP goals.

Q.6 a) What are routing protocols? Write the design issues and goals of routing protocols in detail.

b) Explain dynamic state routing (DSR) in detail.

Q.7 Write short notes on:

a) Registration.

b) Tunneling.

c) Optimization.

d) Reverse tunneling.

End Semester Examination, May 2016

MCA - Fifth Semester
Q.1 a) O-notation provides an asymptotic:
   i) Upper bound ii) Lower bound
   iii) Light bound iv) None of these

b) The complexity of selection sort algorithms:
   i) O(n) ii) O(log n)
   iii) O(n^2) iv) O(n)

c) When data are to be deleted from a data structure, but there is no data available, this situation is called?
   i) Underflow ii) Overflow
   iii) Houseful iv) Saturated

d) _______ is a top down approach for solving problem:
   i) Divide and conquer ii) Backtracking
   iii) Dynamic programming iv) Divide

e) The running time of quick sort depends on:
i) Number of inputs
Arrangement of elements

iii) Size of elements
Pivot elements

f) Case does not exist in complexity theory is _________.

g) Greedy method use ________ optimization.

h) _________ approach is used to get optimal solution of travelling sale problem.

i) What are two methods to get minimum spanning tree?

j) Coloring of vertices of graphs using finest possible number of color is called ________ coloring.

\[ 1^{1/2}\times10 \]

**UNIT-I**

Q.2  

a) Differentiate between linear and binary search and explain which one is better and why?

b) Drive the complexity of binary search.

\[ 7^{1/2}\times2 \]

Q.3  

Solve the list using merge sort:

\[
15 \quad 9 \quad 17 \quad 25 \quad 12 \quad 3
\]

Also analyze the complexity of merge sort using recurrence relation. Write the algorithm for the same.

\[ 15 \]

**UNIT-II**

Q.4  

Solve the job sequencing with deadline for the given data. Also write algorithm for the same:

<table>
<thead>
<tr>
<th>Profit</th>
<th>20</th>
<th>15</th>
<th>10</th>
<th>5</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deadline</td>
<td>2</td>
<td>4</td>
<td>1</td>
<td>3</td>
<td>3</td>
</tr>
</tbody>
</table>
Q.5 Find MST for given graph using Prim’s method. Also write algorithm for same.

UNIT-III

Q.6 Solve the travelling salesman problem with given cost matrix:
Q.7 What do you mean by graph coloring? What is 4-phanar graph problem? Write algorithm for graph coloring and also explain it with the help of an example.  

UNIT-IV

Q.8 State and prove Cook’s theorem.

Q.9 Explain the following:
   a) P class.
   b) NP class.
   c) NP hard.
   d) NP complete.
   e) NP scheduling.
End Semester Examination, May. 2016

MCA - Fifth Semester

DATA MINING AND DATA WAREHOUSING (MCA-503)

Time: 3 hrs

Max Marks: 75

Note: Attempt FIVE questions in all; taking at least ONE question from each Unit. Q.1 is compulsory. All questions carry equal marks.

Q.1 Fill in the blanks:

a) Data mining is also known as ________.
b) The first step in the process of knowledge discovery from data is _________.
c) Classification is ________ learning.
d) __________ is the famous algorithm for classification.
e) __________ and ________ determine the importance of Association Rule.
f) MOLAP stands for ________.
g) Web mining is used to _________.
h) Binning is used to _________.
i) OLTP stands for ___________.
j) Spatial data determines _________.

1½x10

UNIT-I

Q.2 Differentiate between the following:

a) Data mining and Data warehouse.
b) ROLAP and MOLAP.

Q.3 Write short notes on the following:

a) OLAP.

b) Need of data mining.

UNIT-II

Q.4 a) What is an outlier? Explain the ways of removing outliers from data in detail.

b) Explain with the help of an example the need of normalization.

Q.5 Explain the various ways of mining the data.

UNIT-III

Q.6 What is the need of clustering the data? Explain the partition based method of clustering the data.

Q.7 a) What is classification? Why classification is termed as supervised learning?

b) Explain the need of classification using an example.

UNIT-IV

Q.8 Write short notes on:

a) Web mining.

b) Histogram analysis.
c) Application of data mining in healthcare.

Q.9 Explain the need of text mining using an example.

End Semester Examination, May 2016

MCA – Third Semester
Q.1 a) A World Wide Web contains web pages:
   i) Residing in many computers.
   ii) Created using HTML.
   iii) With links to other web pages.

b) The variables of PHP states with ___________.

c) Is JavaScript case sensitive or not?

d) Name the property to change the colour of text in CSS.

e) Which attribute will give the border in the table?

f) <I> ............ <I1> indicates:
   i) Insert
   ii) Italics
   iii) Indent
   iv) Increase font

g) The tag used in HTML to link it with other URL’s is:
   i) <A>
   ii) <H>
   iii) <U>
   iv) <L>

h) Which tag is used for arranging tags in paragraphs?
   i) <par>
   ii) <paragraph>
   iii) <p>
   iv) <a>

i) Which of the following is not scripting language?
   i) HTML
   ii) XML
iii) Postscript  iv) JavaScript

j) What must you know in order to get a website?

i) Its URL  ii) Its Header

iii) Its Title  iv) Name of its webmaster 1½×10

UNIT-I

Q.2  a) What are the factors to keep in mind while designing a website for a client? 10

b) Differentiate between external and internal links. 5

Q.3  Design a registration form in HTML that shows personal details, area of interest, year of passing, marks of various subjects and total marks as result. 15

UNIT-II

Q.4  a) Write advantages and disadvantages of PHP. 5

b) What is an array? Explain their types with examples. 10

Q.5  a) What do you mean by expression? Explain Boolean, Arithmetic and Relational expressions. 10

b) Differentiate between echo( ) and Print( ) function. 5

UNIT-III

Q.6  a) Define PHP class and object. What are the benefits of creating objects? 10

b) What is $this variable? How is it used? 5

Q.7  What is deconstructor? How do we define deconstructor? Write a program to demonstrate the concept. 15

UNIT-IV

Q.8  a) Write a short note on MySQL. 5

b) What are DCL statements? What are various DCL statements available in MySQL? 10
Q.9 What is a join? What are different types of joins available in MySQL? Explain with examples.
Q.1 Multiple choice questions:

a) One byte equals to how many bits?
   i) 4   ii) 8   iii) 12   iv) 16

b) I/O processor has direct access to:
   i) Main memory   ii) Secondary memory
   iii) Flash Memory   iv) ROM

c) Which among the following is an important data transfer technique?
   i) CAD   ii) CAM   iii) DMA   iv) MMA

d) User program interact with I/o devices through:
   i) Operating system   ii) Hardware   iii) Buses   iv) None of the above

e) During the execution of program which gets initiatives.
   i) MDR   ii) IR   iii) PC   iv) MAR

f) _________ is used to store data in registers.
   i) D flip-flop   ii) JK flip-flop   iii) RS flip-flop   iv) None of the above

g) Which register is used to store the flag?
   i) Flag   ii) Status   iii) Test   iv) Log

h) _________ format is usually used to store data.
   i) BCD   ii) Decimal   iii) Hexadecimal   iv) Octal

i) The 8-bit encoding format used to store data is:
i) ASCII  ii) EBCDIC  iii) ANCI  iv) USCII
j) Which memory device is made of semiconductors?
   i) RAM  ii) Hard-disk  iii) Floppy disk  iv) CD

UNIT-I

Q.2  a) What is the purpose of Binary Number System? Justify your answer.  
     b) Explain all the logic gates in detail.

Q.3 Simplify the following functions using K-Map.
   a) \( F(A, B, C, D) = \Sigma (2, 3, 6, 7, 9, 11, 12, 13, 14, 15) \)
   b) \( F(A, B, C) = \Sigma (0, 1, 2, 4, 5, 6) \)
   c) \( F = \sum \overline{B} \overline{C} \overline{D} + BC \overline{D} + ABCD + \varphi \left( \overline{B} \overline{C} \overline{D} + \overline{A} \overline{B} \overline{C} \overline{D} \right) \)

UNIT-II

Q.4  a) What are various types of instructions? Explain with the help of an example.
     b) What do you mean by input output interrupt.

Q.5 Write short notes on:
   a) General register organization.
   b) Stack organization.
   c) Addressing Modes.

UNIT-III

Q.6 Differentiate between following:
   a) I/O vs memory bus.
   b) Isolated vs memory mapped I/O.
   c) Asynchronous vs synchronous data transfer.
Q.7 Explain booth multiplication algorithm with the help of an example. 15

UNIT-IV

Q.8 Explain the following:
   a) Cache memory.
   b) Virtual memory.
   c) Page replacement. 5x3

Q.9 What do you mean by parallel processing? Explain pipeline process in detail. 15

End Semester Examination, May 2016

MCA – Third Semester
Q.1  a) Every finite integral domain is a _________.

b) Linear transformation is the rotation of coordinates about the _________.

c) If a matrix A is orthogonal, then ________ is also orthogonal.

d) Normal distribution is a ________ distribution.

e) A solution of an linear programming problems means _________.

f) Find the rank of the matrix:

\[
A = \begin{bmatrix}
3 & 2 & -1 \\
4 & 2 & 6 \\
7 & 4 & 5
\end{bmatrix}
\]

g) What do you mean by correlation between two variables?

h) State consistency theorem.

i) A fair coin is tossed four times. Find the probability that they are all heads if first two tosses results in head.

j) Explain level of significance.  

UNIT-I

Q.2  a) Using consistency theorem, solve the following equation:

\[
\begin{align*}
x + y + z &= 9 \\
2x + 5y + 7z &= 52 \\
2x + y - z &= 0
\end{align*}
\]

b) Find the value of \((\lambda)\) and \((\mu)\) for which the system of equations:
\[
\begin{align*}
3x + 2y + z &= 6 \\
3x + 4y + 3z &= 14 \\
6x + 10y + \lambda z &= \mu
\end{align*}
\]
Has

i) Unique solution

ii) No solution

Q.3  

a) Find a basis for the subspace of \( P_2 \) spanned by the vectors:

\[1 + x, \quad x^2, \quad -2 + 2x^2, \quad -3x\]

b) Find a standard basis vector that can be added to the set:

\[S = \{-1, 2, 3\}, \quad (1, -2, -2)\]  

to produce a basis of \( R^3 \).

UNIT-II

Q.4  

a) Show that the matrix

\[
A = \begin{bmatrix}
8 & -8 & -2 \\
4 & -3 & -2 \\
3 & -4 & 1
\end{bmatrix}
\]

is diagonalizable. Hence find the transforming matrix and the diagonal matrix.

b) Find the characteristic vectors of the matrix:

\[
A = \begin{bmatrix}
3 & 1 & 0 \\
0 & 3 & 1 \\
0 & 0 & 3
\end{bmatrix}
\]

Q.5  

a) Verify Cayley Hamilton theorem for the matrix:
and hence find $A^{-1}$

b) Show that the matrix.

$$
A = \begin{bmatrix}
2 & -1 & 1 \\
-1 & 2 & -1 \\
1 & -1 & 2
\end{bmatrix}
$$

is not similar to diagonal matrix.

**UNIT-III**

Q.6 a) Find the equation of the lines of regression based on the following data:

\[
\begin{aligned}
x &: 4 & 2 & 3 & 4 & 2 \\
y &: 2 & 3 & 2 & 4 & 4
\end{aligned}
\]

b) Calculate the covariance and the coefficient of correlation between $x$ and $y$ if

$n = 10$, $\Sigma x = 60$, $\Sigma y = 60$, $\Sigma x^2 = 400$, $\Sigma y^2 = 580$ and $\Sigma xy = 305'$

Q.7 a) The mean height of 500 students is 151 cm and the standard deviation is 15 cm. Assuming that the heights are normally distributed, find the number of students whose heights lie between 120 cm and 155 cm.

b) The following data shows the number of seeds germinating out of (10) on damp filter for (80) sets of seeds. Fit a binomial distribution to this data:

\[
\begin{aligned}
x &: 0 & 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 & 9 & 10 \\
f &: 6 & 20 & 28 & 12 & 8 & 6 & 0 & 0 & 0 & 0 & 0
\end{aligned}
\]

**UNIT-IV**

Q.8 a) Use simplex method to solve the following linear programming problems:

Maximize \( z = x_1 + x_2 + 3x_3 \)
Subject to the constraints

\[ 3x_1 + 2x_2 + x_3 \leq 3 \]
\[ 2x_1 + x_2 + 2x_3 \leq 2 \]

and \( x_1, x_2, x_3 \geq 0 \)

b) Discuss the steps to formulate the linear programming problems.

Q.9 a) Using graphical method, find the maximum value of \( z = 2x + 3y \) subject to the constraints.

\[ x + y \leq 30 \]
\[ y \geq 3 \]
\[ 0 \leq y \leq 12 \]
\[ 0 \leq x \leq 20 \]
\[ x - y \geq 0 \]
\[ x, y \geq 0 \]

b) Discuss the standard form of linear programming problems.

End Semester Examination, May 2016

MCA - Fourth Semester

OBJECT ORIENTED PROGRAMMING IN JAVA (MCA-4001)
Q.1 State whether TRUE or FALSE:

a) A private variable can only be accessed from within the class.

b) True is a keyword in Java.

c) We can use keywords as variable names.

d) Classes can only be public.

e) Only one constructor can be declared in a class.

f) AWT stands for abstract window toolkit.

g) We can create any number of classes in a single Java file.

h) String is a class in Java.

i) Object class is the parent of all classes.

j) A static variable can only be accessed from a static function.

1½x10

UNIT-I

Q.2 Write short notes on:

a) Private and public.

b) Do-while.

c) Arrays.

5x3
Q.3  
   a) Explain garbage collection in detail.  
   b) What is the difference between strings in Java and strings in C?

UNIT-II

Q.4  
   a) What is concurrency? How is concurrency controlled in Java?
   b) Demonstrate the concept of multiple inheritance in Java using a simple program.

UNIT-III

Q.5  
   Write short notes on:
   a) Interface  
   b) Deadlock  
   c) Final

Q.6  
   a) What is AWT? What is the importance of AWT in creating application?
   b) Explain any three controls of AWT using suitable examples.

UNIT-IV

Q.7  
   Write short notes on:
   a) Init
   b) try-catch
   c) Event handling

Q.8  
   Write short notes on:
   a) Connection manager
   b) Connection string
Q.9  

a) What is Servlet? Explain the importance of Servlet in J2EE.  

b) Write a short note on JSP.
Q.1 Fill in the blanks:

a) __________ involves the integration of software and hardware.

b) __________ is the oldest and most widely used paradigm for software engineering.

c) Software engineering occurs as a consequence of a process called __________.

d) __________ is a software engineering task that bridges the gap between system level software allocation and software design.

e) __________ is a modular building block for computer software.

f) __________ is a black box testing method.

g) Function oriented metrics were first proposed by __________.

State whether the following statements are TRUE or FALSE:

h) A process model for software engineering is chosen based on the nature of the project.

i) Data design defines the relationship among major structural elements of the program.

j) In tabular design notation a decision table is divided into two quadrants.

UNIT-I

Q.2 a) Describe the software engineering layers in detail.

b) Write a note on computer based system.

Q.3 Write short notes on:

a) Software crisis.

b) Agile methodology.

c) Requirements gathering.
UNIT-II

Q.4 Describe the metric for the design model of a product. What are the attributes of effective software metrics? 15

Q.5 a) State and explain various requirement engineering tasks in detail. 10
   b) Describe the different views of system engineering hierarchy. 5

UNIT-III

Q.6 a) Explain the features of scenario based testing. 8
   b) Discuss ‘Regression Testing’ and its importance. 7

Q.7 Explain the following:
   a) Cause-effect graphing.
   b) Models for software testing.
   c) Testing principles. 5x3

UNIT-IV

Q.8 Explain in detail the highlights of capability maturity model of SEI process. 15

Q.9 Differentiate between the following:
   a) Alpha testing and Beta Testing.
   b) Software Quality Control and Software Quality Assurance.
   c) Load testing and stress testing. 5x3

End Semester Examination, May 2016

MCA - Fourth Semester

ARTIFICIAL INTELLIGENCE (MCA-4003)
Q.1 Multiple choice questions:

a) In AI, representation of __________ is a combination of data structures and interpretive procedures that is used in the right way in a program.
   i) Knowledge ii) Power
   iii) Strength iv) Intelligence

b) The turing machine showed that we can use a/an __________ system to program any algorithmic task.
   i) Binary ii) Electromechanical
   iii) Recursive iv) Semantic

 c) What is the term used for describing the judgmental or commonsense part of problem solving?
   i) Heuristic ii) Critical
   iii) Value based iv) Analytical

 d) A* algorithm is based on:
   i) Breadth-first search ii) Depth-first search
   iii) Best-first search iv) Hill climbing

 e) How is Fuzzy logic different from conventional control methods?
i) IF and THEN approach
ii) FOR approach
iii) WHITE approach
iv) ELSE - IF approach

f) A perceptron is:
   i) Fee-forward neural network
   ii) Back-propagation algorithm
   iii) Back-tracking algorithm
   iv) Feed forward-backward algorithm

g) What is cybernetics?
   i) Study of communication between two machines.
   ii) Study of communication between human and machine.
   iii) Study of communication between two humans.
   iv) Study of Boolean values.

h) In Baye’s theorem, what is meant by $P(H_i \mid E)$?
   i) The probability that hypothesis $H_i$ is true given evidence E.
   ii) The probability that hypothesis $H_i$ is false given evidence E.
   iii) The probability that hypothesis $H_i$ is true given false evidence E.
   iv) The probability that hypothesis $H_i$ is false given false evidence E.

i) Machine learning is:
   i) The autonomous acquisition of knowledge through the use of computer programs.
   ii) The autonomous acquisition of knowledge through the use of manual programs.
   iii) The selective acquisition of knowledge through the use of computer programs.
   iv) The selective acquisition of knowledge through the use of manual programs.

j) Which is also called single inference rule?
   i) Reference
   ii) Resolution
Q.2 a) Determine whether goal-driven or data-driven search would be preferable for solving each of the following problems. Justify your answer:

i) Diagnosing mechanical problems in an automobile.

ii) You’ve met a person who claims to be your distant cousin with a common ancestor Rani. You would like to verify her claim.

b) What are the problems encountered in hill climbing? Discuss.

Q.3 Define heuristic search technique. Explain best first search algorithm with an example. How heuristic search technique is better than any other search technique?

Q.4 Explain the following with examples:

a) Semantic Networks.

b) Frames.

c) Scripts.

Q.5 a) Represent the following sentences in predicate logic form:

i) All women who like ice-creams like chocolates.

ii) The best movie in Hollywood is always better than the best movie in Bollywood.

iii) Some people like eating outside all the time and some people like eating at home all the time.

iv) John likes all kinds of food.
v) All the children likes sweets. 5

b) Differentiate predicate and propositional logic. 5
c) Define resolution and name its types. 5

UNIT-III

Q.6 a) Compare and contrast the programming languages of AI. 6

b) Elucidate the various passing techniques. 9

Q.7 a) Draw the architecture of an expert system. What are the characteristics of an expert system? 8

b) Define NLP and throw a light on its principles. 7

UNIT-IV

Q.8 State the Baye’s theorem. How is it useful for decision making under uncertainly. 15

Q.9 Write short notes on:
   a) Fuzzy set.
   b) Neural network.
   c) Perception. 5x3

End Semester Examination, May 2016

MCA - Fourth Semester
Q.1 Multiple choice questions:

a) As frequency increases, the period __________.
   i) Decreases  
   ii) Increases
   iii) Remains same  
   iv) None of the above

b) The inner core of an optical fiber is _______ in composition.
   i) Glass  
   ii) Fused silica
   iii) Wood  
   iv) None of the above

c) Synchronous transmission does not have ________.
   i) A start bit  
   ii) A stop bit
   iii) Gap between bytes  
   iv) All of the above.

d) ________is the protocol suite for the current internet.
   i) TCP/IP  
   ii) NCP
   iii) UNIX  
   iv) ACM
e) _______ control refers to methods of error detection and correction.
   
   i) Flow
   
   ii) Error
   
   iii) Transmission

   iv) None

   of the above

Fill in the blanks:

f) Full form of VIRUS is ________.

g) The equation for additive inverse is ________.

h) Three common algebraic structures are ________.

i) DES is used in ________ key encryption.

j) PKI stands for ____________.

UNIT-I

Q.2 What is switching? What are the various types of switching? Differentiate between circuit switching and packet switching with a suitable example.

   15

Q.3 Differentiate between the following:

   a) Synchronous and Asynchronous transmission.

   b) Analog and Digital signals.

   c) Bus and Ring topology.

   5x3

UNIT-II

Q.4 A receiver receives a code 11001100111. When it uses the hamming encoding algorithm, the result is 0101. Which bit is in error? What is the correct code?

   15

Q.5 Explain the various frames of HDLC. How do we differentiate various frames of HDLC through their control bit? Also explain the concept of bit stuffing in HDLC by giving
suitable examples.

UNIT-III

Q.6  a) What are the three D’s of security? Explain each ‘D’ with a suitable example.

b) Explain various defense models in relation to network security.

Q.7  Find all solutions to each of the following linear equations:

i)  $4x = 4 \pmod{6}$

ii) $9x + 4 = 12 \pmod{7}$

UNIT-IV

Q.8  Compare the digital signature and conventional signature with respect to the following four parameters:

a) Inclusion.

b) Verification.

c) Relation.

d) Duplicity.

Q.9  What is biometrics and biometrics authentication? Why is there a need to take multiple samples during the user registration process of biometrics? Give suitable examples.

End Semester Examination, May 2016

MCA – Fourth Semester

CLOUD COMPUTING (MCA-4007-A)
Q.1 Answer the following questions in one word or in one line only.

   a) What is a private cloud?
   b) What is cloud busting?
   c) Explain micro-blogs.
   d) What are top 3 cloud providers in the market?
   e) What are the services of cloud computing?
   f) Discuss distributed computing.
   g) What are top technologies for cloud computing?
   h) Write one advantage and disadvantage of using cloud computing.
   i) Discuss one big challenge in cloud computing.
   j) What is best definition of cloud computing? \(1\frac{1}{2} \times 10\)

UNIT-I

Q.2 What is cloud computing? Write down the different features of cloud computing in detail. \(15\)

Q.3 Discuss the different challenges of cloud computing while implementing it in any organization. \(15\)

UNIT-II

Q.4 Explain the architecture of cloud computing. What are the different characteristics of the best architecture? \(15\)

Q.5 Explain the difference between public, private and communication cloud. \(15\)
UNIT-III

Q.6 Explain the different services provided in cloud computing. How platform as a service (PaaS) is more powerful than any other service?  

Q.7 Discuss the infrastructure as a service (IaaS) of any organization in context to cloud computing and its implementation.  

UNIT-IV

Q.8 What are the different administrative tools used in cloud computing? Explain all in detail.  

Q.9 How cloud storage is more in demand in the education sector now-a-days? Explain your answer with the help of any real life example.  

End Semester Examination, May 2016  
MCA - Fifth Semester  
PROGRAMMING IN .NET (MCA-5001)
Q.1 **State whether the following statements are TRUE or FALSE:**

a) Garbage collector can be forcefully called by using system gc():

b) Reference type variables cannot be declared as local.

c) Access modifier internal is for usage within the assembly.

d) A function must always have a return type.

e) There are no destructors in C#.

f) Outer class can never be private.

g) ADO.NET supports connection to sql server only.

h) ‘This’ keyword can be used within a static method.

i) You need IIS to run ASP.NET application.

**Answer the question:**

j) JIT stands for:

   i) Just in time

   ii) Just interpretation technique

   iii) Justified in time

   iv) None of the above

\[ 1\frac{1}{2} \times 10 \]

**UNIT-I**

Q.2 a) Explain the .NET architecture in detail.
b) What is the importance of garbage collection?

Q.3 Write short notes on the following:
   a) CTS
   b) Name space
   c) IL
   d) Value type and ref type

UNIT-II

Q.4 a) Differentiate between C# and C++.

b) What is a function in C#? How is it defined?

Q.5 Explain the concept of inheritance. What are different types of inheritance in C#? What are the problems associated with multiple inheritance?

UNIT-III

Q.6 Write short notes on:
   a) ADO
   b) XML
   c) Dataset

Q.7 Write a program to connect to SQL server and execute a SQL select query and bind the data with a grid view component.

UNIT-IV
Q.8 Write short notes on:

a) Web forms.
b) Web services.
c) Master page.

Q.9 a) Differentiate between GET and POST method.

c) Explain the usage of session object with the help of an example.
Q.1  **State whether the following statements are TRUE or FALSE:**

a) Facts are typically numerical values that can be aggregated.

b) The time horizon in data warehouse is usually 1-2 years.

c) Operational meta data defines the structure of data held in operational databases and used by transactional applications.

d) The star schema is composed of four fact tables.

e) Removing duplicate records is a process called data cleaning.

f) In market-basket analysis, for an association rule to have business value, it should have confidence only.

g) Web-usage mining can be used for target advertising.

**Answer the following questions:**

h) Define support.

i) Define dimension.

j) Define decision tree.

**UNIT-I**

Q.2  a) What are data marts? Discuss its types in detail.

b) Write a short note on multidimensional data model.

Q.3  Discuss three-tier data warehouse architecture in detail.
UNIT-II

Q.4  a) List and describe the five primitives for specifying a data mining task.  

10

b) What is data mining? Discuss various applications of data mining.  

5

Q.5  Explain in detail the architecture of data mining system with a diagram.  

15

UNIT-III

Q.6  Discuss about various categories of association rules. Give an example of each.  

15

Q.7  What is clustering? Discuss various types of variables in cluster analysis. Give example of each.  

15

UNIT-IV

Q.8  Write a short note on multimedia databases.  

15

Q.9  Explain in detail the mining of World Wide Web.  

15

End Semester Examination, May 2016

MCA - Fifth Semester

PROGRAMMING IN UNIX (MCA-5003)

Time: 3 hrs  

Max Marks: 75
Q.1 Multiple choice questions:

a) Unix operating system was first developed by:
   i) Dennis Ritchie
   ii) Bjarne Stroustrup
   iii) Ken Thompson
   iv) Brian Kernighan

b) To delete a directory with all the subdirectories and files we use command:
   i) rmdir
   ii) rm
   iii) rm-r
   iv) rm-f

c) File /dev/null:
   i) Is a file
   ii) Has write permission for all
   iii) Is the unix built in dustbin
   iv) All of these

d) Which command is used to extract specific columns from the file?
   i) Cat
   ii) Cut
   iii) Grep
   iv) Paste

e) Which of the following is not a communication command?
   i) write
   ii) mesg
   iii) mail
   iv) grep
f) Which of the following command is used to update access and modification time of a file?
   
   i) grep  
   ii) WC  
   iii) touch  
   iv) cat


g) Which command is used to count just the number of characters in a file?
   
   i) wc-l  
   ii) wc-c  
   iii) wc-w  
   iv) wc-r

h) Which of the following command addresses all users who are currently logged on?
   
   i) write  
   ii) mail  
   iii) wall  
   iv) mesg

i) Which command is used to display the characteristics of a process?
   
   i) pid  
   ii) du  
   iii) ps  
   iv) au

j) Which command is used to display and create files?
   
   i) cat  
   ii) ri  
   iii) ed  
   iv) lyrix

UNIT-I

Q.2 What are inodes? What are the various parameters stored in inode relating to a file or a directory? Illustrate with a suitable example.

15
Q.3 What is the usual permission setting for a file and a directory? What are the various ways to change the permission of a file? Give examples.

UNIT-II

Q.4 What do you mean by pipes and filters? How are these helpful in unix environment? Illustrate through suitable examples.

Q.5 a) What do you understand by a background process? How will you make a process for background process? What are the advantages and disadvantages of running a process in the background?

b) What are the different states of a process?

UNIT-III

Q.6 Write a shell script to check whether the number entered by user is prime or not.

Q.7 Write a shell script to compare two files. Also check how many words are common in files and count their frequency as well.

UNIT-IV

Q.8 What do you understand by UDP? How is UDP socket useful in unix? Illustrate with a suitable example.

Q.9 Explain the following in relation to TCP sockets:

a) Bind

b) Listen
c) Accept

d) Fork

e) Exec

f) Socket function
Note: Attempt **FIVE** questions in all; **taking at least ONE question** from each Unit. **Q.1 is compulsory.** All questions carry equal marks.

Q.1 Choose the correct option:

a) The special operators for sub-queries are:
   i) Exists
   ii) Some and All
   iii) Any
   iv) All

b) Select statement include:
   i) Select from where
   ii) Views
   iii) Sequences
   iv) Indexes

c) What are main types of transparency in a DBMS?
   i) Distribution
   ii) Transaction
   iii) Both of them
   iv) None

d) What are the different strategies regarding the placement of data?
   i) Centralized
   ii) Fragmented
   iii) Selective replication
   iv) All of the above

e) Which operator is used for declaring variables that refer to the database columns?
   i) +
   ii) %
   iii) —
   iv) *

f) Which of the following is not an oracle data type?
UNIT-I

Q.2 Discuss the advantages and disadvantages of data replication and explain various types of fragmentations with examples.

15

Q.3 a) Compare the different strategies of data allocation.

7

b) What layers of transparency should be provided with DDBMS? Discuss.

8
Q.4 What do you mean by SQL constraints? Explain various types of constraints with an example.  

Q.5 Explain the following:  
   a) EF Codd rules of RDBMS.  
   b) Components of SQL.  
   c) Integrity constraints.  

UNIT-III  
Q.6 What are the advantages of PL/SQL? Explain and write a PL/SQL code to check whether a number is even or odd.  

UNIT-IV  
Q.7 a) What is the importance of error handling? How errors are handled in PL/SQL?  
   b) What is the syntax to create local procedure? Explain with an example.  

Q.8 What do you mean by cloud databases? Discuss the various methods to run a database on the cloud. Explain the characteristics and architecture of it.  

Q.9 What do you mean by big data? What are the basic characteristics of big data? Discuss its various applications.
End Semester Examination, May 2016

MCA – Fifth Semester

SOFTWARE PROJECT MANAGEMENT (MCA-5005(B))

Time: 3 hrs

Max Marks: 75

No. of pages: 2

Note: Attempt FIVE questions in all; taking at least ONE question from each UNIT. Q.1 is compulsory. All questions carry equal marks.
Q.1

a) Use of formal reviews are ________.

b) Formula for calculating function point count for the system is ________.

c) ________ software development model is most suited to a system where all the requirements are known as the start of the project.

d) Which of the following statement are not true?

i) A good design methodology should provide a clear division of design from implementation.

ii) A good design methodology should help to minimize future maintenance.

iii) A good design methodology should encourage shared development of software.

e) Define software requirements.

f) Configuration action is not a part of a software quality assurance plan. (True/False)

g) Draw software configuration diagram.

![Software Configuration Diagram]

h) What does the above diagram shows?

i) Quality engineer is not usually present in a technical review. (True/False)

j) What type of software development model is shown in the following diagram?

![Software Development Model Diagram]

1½×10

UNIT-I

Q.2 Explain W5 HH principle given by Barry Boehm.
Q.3 Explain the following:
   a) Metrics in process and project domain.
   b) Metrics for software quality. 7½x2

UNIT-II

Q.4 What is software project planning? Describe process of planning during the restoration of software project. 15

Q.5 Explain the following:
   a) Software scope and feasibility.
   b) Software project estimation. 7½x2

UNIT-III

Q.6 Explain the concept of risk in software project management. What are the different software risks? Differentiate between reaction and proactive risk strategies. 15

Q.7 Draw and explain the overview of project scheduling in brief. 15

UNIT-IV

Q.8 Write short notes on:
   a) Statistical software quality assurance.
   b) Defect prevention planning. 7½x2

Q.9 Explain in detail the method of software quality assurance plan. 15
Note: Attempt **FIVE** questions in all; **taking at least ONE question** from each **UNIT**. **Q.1 is compulsory**. All questions carry equal marks.

Q.1  

a) GPRS system is an extension to GSM that operates:
   i) Circuit switched 
   ii) Packet switched 
   iii) Both i) and ii) 
   iv) None of the above 

b) All CDMA based technologies, 2G and 3G have _________ handovers.
   i) Hard 
   ii) Soft 
   iii) Softer 
   iv) None of the above 

c) The access method used in CDMA is CDMA while in GSM it is:
   i) FDMA 
   ii) CDMA 
   iii) TDMA 
   iv) All of the above 

d) LTE stands for:
   i) Lite Technical Edge 
   ii) Long Term Evolution 
   iii) Linear Technological Evolution 
   iv) None of the above 

e) The core concept used in cellular technology is:
   i) TDM 
   ii) Frequency resuse 
   iii) Code resuse 
   iv) None of the above 

f) Which of the following are the main parts of basic cellular system?
   i) A mobile unit 
   ii) A cell site 
   iii) A mobile telephone switching office 
   iv) All of the above 

g) The basic GSM is based on _________ traffic channels.
   i) Connection oriented 
   ii) Connection less 
   iii) Packet switching 
   iv) Circuit switching 

h) In _________ frequency spectrum is divided into smaller spectra and is allocated to each user.
   i) FDMA 
   ii) TDMA
iii) CDMA  
iv) FGMA  
i) WAP stands for:  
i) Wire Access Process  
ii) Wireless Application Protocol  
iii) Wireless Access Protocol  
iv) None of the above  
j) The three tiers of mobile computing architecture are __________, __________ and __________.

UNIT-I
Q.2 What are wireless networks? What are the generations of wireless networks? Explain the concept of cellular technology.

Q.3 a) What are the advantages and limitations of mobile computing?  
b) Explain the architecture of mobile computing.

UNIT-II
Q.4 Explain the architecture of wireless application protocol in detail.

Q.5 a) Explain security in wireless LAN.  
b) Differentiate Adhoc v/s Infrastructure mode in wireless networks.  
c) Differentiate various authentication modes in wireless networks.

UNIT-III
Q.6 a) Write a short note on Adhoc wireless internet.  
b) Explain dynamic state routing algorithm in detail.

Q.7 a) Explain problems of message routing in wireless Adhoc mobile networks.  
b) Explain Adhoc on Demand Distance Vector (ADDV) algorithm in detail.

UNIT-IV
Q.8 Write short notes on:
Q.9  a) What are the goals of mobile IP?  
      b) Explain agent discovery and registration in mobile IP.

End Semester Examination, May 2016
B. Sc. (Information Technology) – Fifth Semester
PERSONALITY DEVELOPMENT-5 (IT.518)

Time: 3 hrs  Max Marks: 50
No. of pages: 1

Note: Attempt FIVE questions in all; Q.1 is compulsory. Attempt any TWO questions from Part A and TWO questions from Part B. Each question carries equal marks.
Q.1 Write about any two of the following topic (approximate 250 words):
   a) Win- Win negotiation.
   b) Time Wasters.
   c) SMART Goal.  

**PART-A**

Q.2 What is Goal Setting? What are the advantages and disadvantages of Goal setting?  

Q.3 Describe a time when you anticipated potential problems and developed preventive measures.  

Q.4 “Time management is the process of controlling your life through your use of the 24 hours that you have in a day.” Explain the statement in your own words.  

**PART-B**

Q.5 Prepare your LinkedIn profile.  

Q.6 What are the 25 individual competencies of Emotional Intelligence?  

Q.7 What are the parameters to resolve Cross Cultural conflicts?  

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**End Semester Examination, May 2016**

**B. Sc. (Information Technology) - First Semester**

**PERSONALITY DEVELOPMENT-I (IT-103)**

Time: 3 hrs  
Max Marks: 50

Note: Attempt Five questions in all; Q.1 is compulsory. Attempt any TWO questions from Part A and TWO questions from Part B. All questions carry equal marks.
Q.1 Write short notes on (any two):
   a) Intensive and extensive reading.
   b) Intensive and extensive listening.
   c) Non-verbal communication.

**PART-A**

Q.2 What is active listening? What are the common barriers to effective listening?

Q.3 Enlist the points which one will keep in mind while preparing for a presentation.

Q.4 What points one should keep in mind while addressing cross cultural audience?

**PART-B**

Q.5 Write a note on any one of the following:
   a) Time management.
   b) Physical fitness.

Write a paragraph describing any object of your choice which is currently visible to you in the exam room.

Q.6 Explain the process of communication. How is communication important in business organizations?

Q.7 Discuss various qualities of a good professional.
End Semester Examination, May 2016

B. Sc. (Information Technology) – Second Semester

PERSONALITY DEVELOPMENT-II (IT-202)

Time: 3 hrs

Max Marks: 50

No. of pages: 1

Note: Attempt FIVE questions in all; Q.1 is compulsory. Attempt any TWO questions from Part A and TWO questions from Part B. Each question carries equal marks.
Q.1 Write short notes on (any two):
   a) Employ ability.
   b) Making an effective delivery in presentations.
   c) Differentiate between aggression, assertive and passive behavior.

   5x2

PART-A

Q.2 Why are interviews conducted? What are the various process related to preparation for an interview?
   10

Q.3 What is the importance of cross-cultural communication in today’s business environment? Write any two elements of the same.
   10

Q.4 What is citation and reference? Discuss the concepts in details with relevant examples.
   10

PART-B

Q.5 Describe how a personality develops. What are the methods for changing a personality?
   10

Q.6 What are presentations skills? What are the tools for making a presentation effective?
   10

Q.7 What are the pragmatics of cross-cultural communication?
   10
Q.8 What is a stress management? Discuss in details some ways of reducing stress.

10
a) Define desktop virtual reality.
b) Describe various elements of multimedia.
c) What is sub-band coding?
d) What is DVI technology?
e) Explain colour dithering.
f) Define the term ‘anti-aliasing’.
g) Differentiate between hypertext and hypermedia.
h) Define terms: Shape tweening and motion tweening.
i) Explain 41Q colour model.
j) What is CLUT? 2×10

**PART-A**

Q.2 a) What are multimedia authoring tools? Describe their classifications. 10
b) What are the design goals of ATM? Explain various layers of ATM along with their functioning. 10

Q.3 a) What is colour palette? What is the problem of palette flashing? Explain the process of dithering. 6
b) Differentiate between BMP and TIFF image file formats. 4
c) Discuss various steps of JPEG compression technique and objectives of JPEG. 10

Q.4 a) Discuss the role of multimedia in business, entertainment and education fields. 10
b) Explain applications of virtual environment. What are the requirements of virtual coupled systems? 10

**PART-B**

Q.5 a) What is digital audio? How it can be generated from analog audio? Explain in detail. 10
b) Discuss the audio compression of MPEG layer 1 and layer 2 in detail. 10
Q.6  a) Distinguish between lossy and lossless compression of sound.  
     b) List and explain various image file formats.  
     c) Differentiate between speech compression and speech synthesis.  

Q.7  a) Define the term animation. What is cell animation?  
     b) Explain various animation techniques in detail.
a) Coachability.

b) Inter personal skills.

c) Prioritization.

**PART-A**

Q.2 What is non-verbal communication? Discuss different aspects of non-verbal communication.

10

Q.3 What is active listening? How can one become an effective listener?

10

Q.4 a) Imagine a scenario that you and Mr. A work together in the same department of a company. Mr. A has just taken a short break and you receive a call from the manager who has some information to give to Mr. A. Write down the dialogues of the conversation that will follow.

6

b) Why are telephone skills important?

4

**PART-B**

Q.5 What is the importance of setting goals? Explain the various steps to achieve them.

10

Q.6 What points will one keep in mind to draft a crisp formal e-mail? Discuss the Do’s and Don’t’s in detail.

10

Q.7 How can one become a good professional?

10
End Semester Examination, May 2016

B. Tech. – Fourth Semester

DATA COMMUNICATION AND COMPUTER NETWORKS (IT-401A)

Time: 3 hrs

Max Marks: 100

No. of pages: 1

Note: Attempt FIVE questions in all; **Q.1 is compulsory.** Attempt any TWO questions from Part A and TWO questions from Part B. Each question carries equal marks.

Q.1

a) What is data communication?

b) What are digital and analog signals?

c) What are the responsibilities of network layer in internet model?
d) Explain the terms: amplitude, frequency and phase?

e) What are the goals of multiplexing?

f) Why TCP is more reliable than UDP?

g) How does caching increase the efficiency of name resolution?

h) Find class of each address:
   i) 14.23.120.8
   ii) 00000001 00001011 00001011 11101111

i) What are the four fundamental characteristics required for an effective data communication system?

j) Differentiate between connection-less and connection-oriented services?

\[2x10\]

PART-A

Q.2 a) Identify the five components of a data communication system? Also explain various communication modes.

\[8\]

b) What are the various categories of networks? Explain.

\[8\]

c) Explain what are the two types of line configuration and also discuss their PROS and CONS?

\[4\]

Q.3 a) What are the advantages of optical-fiber over twisted-pair and coaxial cables? \[10\]

b) Differentiate between polar and unipolar encoding schemes?

\[10\]

Q.4 a) What are the various multiplexing techniques?

\[10\]

b) Explain what are the various data encryption techniques.

\[10\]

PART-B
Q.5  a) What are the differences between classful and classless addressing in IPV4?  

   b) Explain why collision is an issue in random access protocol but not in controlled access protocol?  

Q.6  a) What are the various open loop and closed loop congestion control techniques?  

   b) Explain routing information protocol in detail.  

Q.7  a) What are the various remote monitoring techniques?  

   b) Write short notes on:  

      i) Firewalls.  

      ii) Proxy servers.  

      5x2
End Semester Examination, May 2016

B. Tech. – Third / Fourth Semester

DATA COMMUNICATION AND COMPUTER NETWORKS (IT-401A)

Time: 3 hrs

Max Marks: 100

No. of pages: 1

Note: Attempt FIVE questions in all; Q.1 is compulsory. Attempt any TWO questions from Part A and TWO questions from Part B. Each question carries equal marks.

Q.1 a) What is the need for data communication?

b) List different data communication components.

c) Define digital and analog signals.

d) Define LAN, WAN and MAN.

e) What is frame relay?
f) Differentiate between Internet and Intranet.
g) Define IP address.
h) Define the term: token bus.
i) Define DNS.
j) What are advantages of internet?

PART-A

Q.2 a) Explain different types of topologies used in a computer networks.
     12

b) Explain different communication modes applicable for a network.
    8

Q.3 a) Differentiate between Manchestror encoding and differential manchestror encoding.
     6

b) Explain twisted pair, co-axial and fiber optic-cables.
    6

c) Briefly explain Nyquist theorem and Shannon limit.
    8

Q.4 a) What do you mean by cryptography? Explain.
     5

b) What is multiplexing? Explain its different types with examples.
    10

c) Explain Huffman encoding.
    5

PART-B

Q.5 a) Explain OSI reference model.
     10

b) What is IP addressing? Explain IP address classes in detail.
    10
Q.6 a) What is routing? Differentiate between static routing and dynamic routing.

b) Explain ATM reference model in detail.

Q.7 Write short notes on:

a) Firewall
b) VLANS
c) Proxy servers
d) Class of service
End Semester Examination, May 2016

B. Tech. – Fourth Semester

JAVA PROGRAMMING (IT-402)

Time: 3 hrs.  Max Marks: 100

No. of pages: 1

Note: Attempt FIVE questions in all; Q.1 is compulsory. Attempt any two questions from PART-A and TWO questions from PART-B. Each question carries equal marks.

Q.1 a) What is the use of “Final” Keyword in java?
   b) Differentiate between Swings and AWT.
   c) What is the role of JVM in java?
   d) What is abstract class?
   e) Define aggregation in java.
   f) Why we use runnable interface in java for creation of thread?
   g) Differentiate between radio buttons and checkboxes.
h) Explain logging in java.

i) Give the difference between checked and unchecked exceptions.

j) Explain how arrays are declared and initialized in java.

2×10

**PART-A**

Q.2 a) What is method overriding? Explain with an example.

b) Create a class named employee with the following details:

   Data Members:

   i) Name.   ii) Age.   iii) Gender.

   Method: - Display ( )

   Create another class full time employee that inherits the employee class:

   Data Members:

   i) Salary.   ii) Designation.

   Method: Display ( ) to show salary and designation along with other employee details.

10×2

Q.3 a) State the different ways of executing an applet.

b) Differentiate applets from application program.

c) Write a program to embed an image inside the applets visible area.

5  5  10

Q.4 a) How do the event objects register the event listener in java?

b) Explain control statements in java with a suitable example.

10×2

**PART-B**

Q.5 a) What is synchronization and why it is important?

b) What is thread priority? How can it be set for a thread, explain it with the help of an example?

10×2

Q.6 Write short notes on:
End Semester Examination, May 2016
B. Tech. – Fifth Semester
INTERNET AND WEB TECHNOLOGY (IT-501)

Time: 3 hrs
Max Marks: 100
No. of pages: 1

Note: Attempt FIVE questions in all; Q.1 is compulsory. Attempt any TWO questions from Part A and TWO questions from Part B. Each question carries equal marks.

Q.1 a) Why e-mail client is required?
b) What is World Wide Web (WWW)?
c) State the purpose of HTTP.
d) Write HTML code for following ordered list beginning with 5. The list is: Cake, Biscuit, Ice cream
e) State the purpose of cascade style sheet (CSS) with an example.

f) Write HTML syntax to insert an image on a web page with height and width =200 pixels.

g) State difference between javascript and HTML.

h) Explain languages used for CGI?

i) Differentiate between ALERT and PROMPT dialog box.

j) Why “Digital signatures” are required?

2x10

PART-A

Q.2  a) Explain working of TCP/IP protocol suite. Draw a neat diagram. 10

b) Explain the working of a ‘bridge’ using a diagram. 5

c) Differentiate between LAN, WAN and MAN. 5

Q.3  a) Explain working of search engine using a neat diagram. 10

b) Describe working of a web browser using a neat diagram. 10

Q.4  a) Write HTML code for the following table:

<table>
<thead>
<tr>
<th>NAME</th>
<th>MARKS</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>WTCS</td>
<td>POS</td>
</tr>
<tr>
<td>Guru</td>
<td>45</td>
<td>40</td>
</tr>
<tr>
<td>Aamir</td>
<td>39</td>
<td>45</td>
</tr>
</tbody>
</table>

10
b) State need of ‘Meta tags’ with supporting examples.

5

c) Write HTML code to create two web pages showing hyper linking between the pages.

5

PART-B

Q.5 a) Write a JavaScript code, which checks the contents entered in a form’s text element. If text element is in lower case, convert it to upper case.

10

b) Write short note on cookies.

5

c) Write JavaScript using ‘prompt dialog box’ which displays the ‘name’. Keyed in along with a greeting message.

5

Q.6 a) Write a short note on personal web server (PWS). State its advantages and disadvantages.

10

b) Explain the steps involved in execution of a servlet use a neat diagram.

5

c) Explain the various differences between classifications of ‘Internet programming’.

5

Q.7 a) Explain the concept and working of ‘digital signature’ using an example.

10

b) Discuss the ‘classification’ of firewall in details with suitable example/diagram.

10
End Semester Examination, May 2016
B. Sc. (Information Technology) - Sixth Semester

MOBILE COMMUNICATION (IT.606)

Time: 3 hrs
Max Marks: 50

No. of pages: 1

Note: Attempt FIVE questions in all; Q.1 is compulsory. Attempt any TWO questions from Part A and TWO questions from Part B. All questions carry equal marks.

Q.1 Write short notes on:
   a) Hiperlan
   b) Bluetooth

5x2

PART-A

Q.2 What is global system for a mobile communication? Explain the important functional blocks of GSM.

10
Q.3 What is multiplexing? What are the different types of multiplexing? Explain this using a diagram.  

Q.4 a) Compare CDMA, FDMA, and TDMA.  

b) Compare various types of handoffs.  

PART-B  

Q.5 Explain the architecture of wireless application protocol in detail.  

Q.6 a) Differentiate between Ad-hoc and Infrastructure networks.  

b) Write a short note on mobile IP.  

Q.7 What is memory management? Explain its functionality in detail.
End Semester Examination, May 2016
B. Sc. (Information Technology) - Sixth Semester

PROGRAMMING WITH JAVA (IT-607)

Time: 3 hrs

Max Marks: 50

No. of pages: 1

Note: Attempt Five questions in all; Q.1 is compulsory. Attempt any TWO questions from Part A and TWO questions from Part B. All questions carry equal marks.

Q.1 Answer any two:

a) What is java virtual machine?

b) What is the difference between C++ and Java?

c) What do you mean by polymorphism? Explain.

d) What is the difference between pass-by-reference and pass-by-value?
   
   5x2

PART-A
Q.2 What is type casting? Explain up-casting and down-casting in Java. When do you get class cast exception?

Q.3 What are static initializers or static blocks with no function names?

Q.4 What do you mean by inheritance? Explain all types of inheritance supported by Java.

PART-B

Q.5 What are the usage of java packages? Explain with programs.

Q.6 What is applet life cycle? Also explain the various methods available in applet class.

Q.7 What is method overriding? Can we overload or override static methods in Java? Justify your answer with a suitable program.
Q.1 The Hindustan Times, 29 April 2016: Wanted Software Developer, for Wipro Technologies, India. The candidate should be an IT Engineering Graduate (Fresher). The candidate must possess excellent communication skills and expertise in its respective field. Attractive salary with perks will be offered to the right candidate. Apply through e-mail, to Mr. Raj Nanda, Manager Recruitment, Wipro Technologies, India, Wipro email id- rajnanda@hotmail.com. Attach your CV along with a covering letter to the mentioned e-mail id.

Q.2 Case Study:

Marketing and Distribution of Mushroom
Sachin and Virag are two enterprising youth. They have passed out from IIM, Bangalore. They thought instead of doing a job, they will launch fresh vegetables in Indian markets. Having learnt of the future conventional foods, they decided to venture into cultivation of mushrooms. Mushrooms are known to be the best alternative food for vegetarians. For Sachin and Virag fund raising was a serious handicap for mass production. However, the first trial batch of mushrooms that they produced was bought by Star Hotel in Bangalore. Further, the hotel placed orders for supply of 20 kgs every day. Now mushroom industry is run by small entrepreneurs, like Sachin and Virag. Another big player M/s Ashtavinayak Mushrooms, equipped with cold storage facility was more interested in the export market. Sachin and Virag have set their sights high. They aim to sell mushrooms in a very big way all over India. Mushrooms have a great market potential and is a perishable food.

Read the case study carefully given above and answer the following questions:

a) How will you advise Sachin and Virag, as how to increase the consumer awareness about this new food? 10

b) What would be your suggestions for distribution channel for mushrooms? 10

Q.3 What are the prerequisites and benefits of Group Discussions? 10

Q.4 Discuss the topic in your own words (word limit-300):

“India is a Soft Nation” 10
End Semester Examination, May 2016

B. Tech. – Sixth / Seventh / Eighth Semester

NETWORK PROGRAMMING AND ADMINISTRATION (IT-701)

Time: 3 hrs

Max Marks: 100

No. of pages: 1

Note: Attempt FIVE questions in all; Q.1 is compulsory. Attempt any TWO questions from Part A and TWO questions from Part B. Each question carries equal marks.

Q.1
a) What is multiservice server?

b) Define routing.

c) Explain the role of select ( ) and pole ( ) functions.

d) Differentiate between TCP and UDP protocol.

e) Compare remote-procedure-call and local-procedure-call.

f) Differentiate between static and dynamic routing.

g) Write the difference between socket and TLI.

h) What is the role of network administrator?
i) Differentiate between ARP and RARP protocol.

j) Why IP is considered a best effort delivery protocol?

2x10

PART-A

Q.2 a) What is NAT? How it translate an address?

5

b) Differentiate between default mask, subnet mask and supernet mask.

5

c) A company is granted the site address 201.70.64.0 (class C). The company needs six subnets. Design the subnets.

10

Q.3 a) Give detailed architecture of TCP based client server communication system. Explain role of each socket call involved with a neat interaction diagram.

10

b) Explain the elementary node and address conversions in the context of TCP and UDP socket.

10

Q.4 a) What is a multiprotocol server? What is the motivation behind multiprotocol server? Explain its working in brief.

5

b) Define NFS and discuss its variants: SNFS and ANFS.

5

c) Define concurrent connection oriented server. Compare it with iterative connection oriented server. Explain single process, concurrent connection oriented server algorithm with a neat process structure diagram.

10

PART-B

Q.5 a) Write down the paradigms for building distributed programs.

5

b) What do you mean by dynamic port mapping? Write RPC port mapper algorithm.

10
c) Write a short note on authentication in RPC.

5

Q.6
a) What do you mean by network administration? Discuss various approaches towards network administration.

10

b) Write short notes on:
   i) PPP
   ii) RADIUS

5

c) What is the role of DNS? Give steps for configuring a DNS server.

5

Q.7
a) Define firewalls. How do they differ from wrappers?

10

b) What do you mean by security planning in a network security?

10
End Semester Examination, May 2016
B. Tech. – Third / Fifth Semester
SOFTWARE ENGINEERING (IT-702)

Time: 3 hrs
Max Marks: 100
No. of pages: 1

Note: Attempt FIVE questions in all; Q.1 is compulsory. Attempt any TWO questions from Part A and TWO questions from Part B. Each question carries equal marks.

Q.1 a) What are the phases of SDLC?
b) What is software metric?
c) Differentiate between product and process.
d) What is context diagram?
e) What is data dictionary?
f) Explain the meaning of abstraction in terms of software design.
g) What is regression testing?
h) What are defect tracking tools?
i) Differentiate between high level and low level design.
j) What do you understand by modularity?

2x10
PART-A

Q.2  a) Explain spiral model with its advantages and disadvantages.  

  15

  b) Explain emergence of software engineering.  

   5

Q.3  a) Draw DFD upto level 2 for library management system.  

    15

  b) Give a brief note on requirement elicitation.  

    5

Q.4  a) Explain the intermediate COCOMO model.  

    10

  b) Write down the life cycle of risk management.  

    10

PART-B

Q.5  a) What is cohesion? Explain its types.  

    10

  b) What are the objectives of system design?  

    10

Q.6  a) Differentiate between white box and black box testing. Also explain their types.  

    15

  b) Differentiate between validation and verification.  

    5

Q.7  a) Explain the software metrics for reliability assessment.  

    10

  b) Explain in brief:  

    i) Fault avoidance.
Q.1  a) What are the objectives of requirement analysis?
    b) What are the difficulties in elicitation?
    c) Differentiate between functional and data modeling.
    d) What is DFD? What does level ‘O’ DFD represent?
    e) Define software reliability.
    f) What are objectives of project planning process?
    g) What are the characteristics of a good SRS document?
    h) The modules in a good design should have low coupling, Why?
    i) What do you mean by risk assessment?
    j) What are the various testing activities?
Q.2  a) Explain RAD (Rapid Application Development) model. What are the advantages and disadvantages of RAD model?

10

b) Explain the various steps involved in software development process.

10

Q.3  a) Explain the prototyping approach in software development process.

10

b) What is DFD? Explain the DFD of library management system.

10

Q.4  a) Explain COCOMO model? How it is different from other techniques?

10

b) Let project was estimated to be \(400\) KLOC. Calculate effort, development, average staff size (ss) and productivity.

(Refer table below Basic COCOMO Co-efficients)

<table>
<thead>
<tr>
<th>Project</th>
<th>(a_b)</th>
<th>(b_b)</th>
<th>(c_b)</th>
<th>(d_b)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organic</td>
<td>2.4</td>
<td>1.05</td>
<td>2.5</td>
<td>0.38</td>
</tr>
<tr>
<td>Semidetached</td>
<td>3.0</td>
<td>1.12</td>
<td>2.5</td>
<td>0.35</td>
</tr>
<tr>
<td>Embedded</td>
<td>3.6</td>
<td>1.20</td>
<td>2.5</td>
<td>0.32</td>
</tr>
</tbody>
</table>

10

PART-B

Q.5  a) Explain boundary value analysis technique with a suitable example.

10

b) Explain design issues in designing a software.

10

Q.6  a) What is modularity? Explain cohesion and coupling with its types.

10
b) Explain the following tests:

Unit testing, integration testing, stress and performance testing.

10

Q.7 Write short notes on (any two):

a) Software quality assurance.

b) Integrated case environment.

c) Reliability and quality standards. 10x2
End Semester Examination, May 2016

B. Tech. – Sixth / Seventh / Eighth Semester

MANAGEMENT INFORMATION SYSTEMS (IT-721)

Time: 3 hrs

Max Marks: 100

No. of pages: 1

Note: Attempt FIVE questions in all; Q.1 is compulsory. Attempt any TWO questions from Part A and TWO questions from Part B. Each question carries equal marks.

Q.1  a) What is MIS? Discuss various components of MIS.
    b) Why information is a quality product? Discuss its classification.
    c) Explain reporting system and its specifications.
    d) What is planning? Discuss strategic planning and its tools.
    e) Explain and discuss applications of MIS to electronic business system.

4x5

PART-A

Q.2  a) Discuss several organizational sectors using MIS. Also, explain their various functional models in detail.

10

b) What are the various software support available for MIS? Also discuss the role of DBMS in detail.

10
Q.3 What are the methods of data and information collection? Discuss general model of information processing. Also explain MIS software and MIS team in detail. 

20

Q.4 Write short notes on:

a) Staff training and functional manuals of MIS. 

10

b) Scheduling of activities in MIS. 

10

PART-B

Q.5 a) What is decision support system? What are its roles and applications? 

10

b) Discuss various DSS models with their working. 

10

Q.6 What are the distinctive objectives of MIS in service sector? Why the service of MIS is distinctive? Also discuss various activities of service sector implemented in MIS. 

20

Q.7 Write short notes on:

a) Security of management of information systems.

b) Privacy issues. 

10x2
End Semester Examination, May 2016

B. Tech. – Sixth / Seventh Semester

E-COMMERCE AND ERP (IT-722)

Time: 3 hrs

Max Marks: 100

No. of pages: 1

Note: Attempt FIVE questions in all; Q.1 is compulsory. Attempt any TWO questions from Part A and TWO questions from Part B. Each question carries equal marks.

Q.1  a) Define e-commerce.
    b) Define ERP.
    c) Differentiate between e-commerce and e-strategy.
    d) Define e-marketing.
    e) What do you mean by home-shopping?
    f) What are advantages of e-commerce?
    g) What are disadvantages of e-commerce?
    h) Define e-mail.
    i) Why there is need for e-commerce?
    j) What do you mean by SAP?

2x10

PART-A

Q.2  a) Explain the role of internet with regards to the development of e-commerce. 10
b) With the help of suitable examples explain the 4Cs of the e-commerce.

Q.3 a) Discuss the various on-line commerce options with suitable examples.

b) Explain electronic payment system and digital payment system in brief.

Q.4 a) Explain various concepts, benefits and applications of EDI model.

b) Write short notes on:
   i) Fire-wall.
   ii) Cryptography.

PART-B

Q.5 a) How can you relate re-engineering and business process redesign?

b) Explain the role of ERP in SCM.

Q.6 a) What are the various modules of ERP system? Explain HRD and accounting modules in detail.

b) Explain the relation between production planning, production scheduling and production control.

Q.7 a) Justify the term: “ERP as an integrated system”.

b) Write short notes on:
   i) ERP life cycle model.
ii) Critical success factor of ERP. 

5x2

End Semester Examination, May 2016

B. Tech. – Sixth / Seventh / Eighth Semester

ADVANCED JAVA PROGRAMMING (IT-801)

Time: 3 hrs

Max Marks: 100

No. of pages: 1

Note: Attempt FIVE questions in all; Q.1 is compulsory. Attempt any TWO questions from Part A and TWO questions from Part B. Each question carries equal marks.

Q.1 

a) Write AWT program to add two numbers.

b) Explain the features of Java beans?

c) Differentiate between URI and URL.

d) What do you understand by digital signatures?

5x4

PART-A

Q.2 

a) What items are required to write a database program? Explain in detail.

10

b) Explain scrollable and updatable result set by giving suitable example.

10

Q.3 Describe client server implementation in detail. Also explain socket timeout.

20
Q.4  a) What is a table? Explain the process of adding and displaying the records of the table with the help of an example.  

   b) What do you mean by progress monitors? Explain with the help of example.

PART-B

Q.5  a) Explain the concept of transparency and composition in AWT with the help of an example.  

   b) Write short notes on:
      i) Clipboard.
      ii) Renders and writers for images.

Q.6  Write in detail on:
      a) Byte code verification.  

Q.7  a) Explain the process of creating an application using beans by taking suitable example.  

      b) What is property editor? Give an example for creating property editor.
Q.1  a) What is process and product?
    b) Write the equation for effort and development time for intermediate COCOMO model.
    c) How SDLC can be selected?
    d) What is resource planning?
    e) What is bottom up approach for effort estimation?
    f) What is risk management?
    g) What is quality management planning?
    h) What is scope management?
    i) What is flexibility matrix?
    j) What is project closer analysis?

\[2 \times 10\]

PART-A
Q.2  
   a) What is process tailoring? Explain it with the help of a suitable example.  
      10
   
   b) What is requirement change management? Explain the change management process in detail.  
      10

Q.3  
   a) Difference between V-model and RAD model. Explain with a suitable example.  
      10
   
   b) Write short notes on:
      i) Man-power planning.
      ii) Financial planning.  
      5x2

Q.4  
   Explain the following terms:
   a) CPM scheduling.  
      10
   
   b) Project planning.  
      10

PART-B

Q.5  
   a) Explain the concept of quality with the help of quality control and quality assurance.  
      10
   
   b) What is risk identification? Explain risk monitoring and tracking in detail.  
      10

Q.6  
   a) Explain the project tracking in context with activities, defect and issues tracking.  
      10
   
   b) Explain the project crashing and fast tracking along with crash process and network analysis.  
      10
Q.7  a) What is quality control tool? Explain it with the help of a suitable example.
   10

b) What is review plan? Explain defect analysis and prevention in detail.
   10
End Semester Examination, May 2016

B. Tech. – Seventh / Eighth Semester

DATA WAREHOUSING AND DATA MINING (IT-822)

Time: 3 hrs

Max Marks: 100

No. of pages: 1

Note: Attempt FIVE questions in all; Q.1 is compulsory. Attempt any TWO questions from Part A and TWO questions from Part B. Each question carries equal marks.

Q.1   a) State advantages and disadvantages of data marts?

   b) What is the importance of a concept hierarchy in data warehouse?

   c) Define dimension and dimension table.

   d) How to detect redundancies table?

   e) What is min-max normalization?

   f) Define base and apex cuboids.

   g) What do you understand by an association rule?

   h) What are outliers? How they can be detected?

   i) What do you understand by multimedia databases?

   j) What is clustering?

   2x10

PART-A

Q.2   a) Explain different OLAP operations using suitable examples.

   10
b) What do you understand by a measure? Explain different types of measures with the
help of suitable examples. 10

Q.3  a) What are the responsibilities of a data warehouse manager? 5
b) Explain distributed and virtual data warehouse. 5
c) Explain three-tier architecture of a data warehouse in detail. 10

Q.4  a) How to index OLAP data? 5
b) How OLAP queries can be processed efficiently? 5
c) Explain the purpose of data transformation in data preprocessing. 10

PART-B
Q.5  a) Discuss various objective measures of pattern matching in data mining. 10
b) Explain the kind of knowledge to be mined w.r.t. data mining primitives. 6
c) Write DMQL syntax for concept hierarchy specification. 4

Q.6  a) What do you understand by market-basket analysis? Explain the basic concept and
technology of association rules. 10
b) Explain the process of classification using decision-tree-induction. 10
Q.7  
a) Explain the important aspects of mining time series databases and sequence databases.  

b) What are the basic measures for text retrieval? Explain keyword based and similarity based retrieval.
End Semester Examination, May 2016

B. Sc. (Information Technology) – Fourth Semester

PERSONALITY DEVELOPMENT-IV (IT.403)

Time: 3 hrs Max Marks: 50
No. of pages: 1

Note: Attempt FIVE questions in all; Q.1 is compulsory. Attempt any TWO questions from Part A and TWO questions from Part B. Each question carries equal marks.

Q.1 Write short notes on (any five):
   a) Time management matrix.
   b) Body language.
   c) Self awareness.
   d) Activity logging.
   e) Cover letter.
   f) Emotional intelligence. 2×5

PART-A

Q.2 Why is time management important? How is it helpful in leading a successful life? Explain the concept of activity logging in brief. 10

Q.3 What is emotional self-awareness? Analyze yourself and write about 300 words describing your emotional traits. 10

Q.4 How do you handle objections raised by a customer? What do you mean by customer satisfaction and customer delight? 10
PART-B

Q.5 You received information about a vacancy for software developer in your dream company through an acquaintance who already works there. Prepare a cover letter and curriculum vitae to be sent to the company. 10

Q.6 What are the different forms of group discussion? Explain the Do’s and Don’ts to be kept in mind during a group discussion. 10

Q.7 How will you dress up for an interview? How will you conduct yourself in front of the interviewing panel? 10
End Semester Examination, May 2016

B. Sc. (Information Technology) – Fifth Semester

SOFTWARE PROJECT MANAGEMENT (IT.512)

Time: 3 hrs Max Marks: 50
No. of pages: 1

Note: Attempt FIVE questions in all; Q.1 is compulsory. Attempt any TWO questions from Part A and TWO questions from Part B. Each question carries equal marks.

Q.1 Define following briefly:
   a) Final closure.
   b) Project splitting.
   c) Project Audit.
   d) Product and Process.
   e) Scheduling techniques.

PART-A

Q.2 a) What is the importance of project management? Explain in details.  
   b) Define all the important characteristic of a project with example.

Q.3 Explain the following with limitation and advantages:
   a) WBS.
   b) PERT/CPM.

Q.4 Explain the concept of critical chain scheduling and its various method.

PART-B
Q.5 What do you understand by total quality management in project management? Explain in details. 10

Q.6 What do you understand by project performance scheduling? Implement its measures and controls. 10

Q.7 What are the various steps to terminate the project? Describe in details. 10
Q.1 Write short notes on (any two):
   a) Means-ends analysis.
   b) Fuzzy logic.
   c) Neural networks.  

PART-A

Q.2 List and discuss the potentially positive and negative effects on society of the development of artificial intelligence.  

Q.3 Express the following sentences involving predicates in symbolic form:
   a) All students are clever.
   b) Some students are not successful.
   c) Every clever student is successful.
   d) There are some successful students who are not clever.
   e) Some students are clever and successful.  

Q.4 Explain various knowledge representation schemes in detail.  

PART-B
Q.5 How do we represent knowledge using the concept of semantic nets and frames?  10

Q.6 Explain the concept of:
   a) Backtracking.  
   b) Probabilistic reasoning.  5×2

Q.7 Identify and explain two best application areas of expert system.  10
End Semester Examination, May 2016

B. Sc. (Information Technology) – Fifth Semester

MULTIMEDIA SYSTEMS (IT.514)

Time: 3 hrs  Max Marks: 50
No. of pages: 1

Note: Attempt FIVE questions in all; Q.1 is compulsory. Attempt any TWO questions from Part A and TWO questions from Part B. Each question carries equal marks.

Q.1 Write short notes on (any two):

a) Software requirement for multimedia.

b) Shading.

c) MIDI.

5×2

PART-A

Q.2 Discuss various multimedia devices in detail.

10

Q.3 Differentiate the following (any two):

a) Hypertext and Hypermedia.

b) ATM and ADSL.

c) JPEG and MPEG.

5×2

Q.4 Discuss the authoring tools required for multimedia in detail.

10

PART-B

Q.5 Explain the following (any two):

a) Sub-band coding.

b) Audio compression.
c) Virtual Reality Operating System.

Q.6 What is digital representation of sound? Explain method for encoding an analog signal in detail.

Q.7 Discuss all MPEG motion video compression standards in detail.
B. Sc. (Information Technology) – Fifth Semester

VISUAL BASIC PROGRAMMING (IT.515)

Time: 3 hrs  Max Marks: 50

Note: Attempt FIVE questions in all; Q.1 is compulsory. Attempt any TWO questions from Part A and TWO questions from Part B. Each question carries equal marks.

Q.1  a) How to declare a variable in VB? Give two examples.
     b) What is a string?
     c) Give two properties of a textbox.
     d) How to declare an array in VB? Give an example.
     e) Give two data type conversion functions in VB.  

     PART-A

Q.2  Explain the following terms:
     a) Event
     b) Toolbar

     PART-B

Q.3  List five important data types available in VB along with their storage details.

Q.4  Explain all conditional statements available in VB in detail.

Q.5  Write short notes on:
     a) Textbox
     b) ComboBox
Q.6  Explain all the steps of creating a Menu using Menu Edition in VB.  

Q.7  a) What is a record-set? How is it used?  
     b) Write all the properties of data-list control.
THE INFORMATION TECHNOLOGY SYSTEM (7.101)

Time: 3 hrs
Max Marks: 50
No. of pages: 1

Note: Attempt FIVE questions in all; Q.1 is compulsory. Attempt any TWO questions from Part A and TWO questions from Part B. All questions carry equal marks.

Q.1  a) Differentiate between Redhat hocker and whitehat haker.

b) Name five output devices and their uses.

c) What is application software? Name an two application softwares.

d) How header and footer can be inserted into a document? Explain its steps.

e) How do charts and graphs help in analyzing data?

2x5

PART-A

Q.2  a) How is primary memory beneficial for a computer system? Also explain the advantages and disadvantages of primary memory in brief.

5

b) How is serial port different from the parallel port?

5

Q.3  a) In what ways “internet can help public service agencies to improve their services to the public?” Justify your answer.

5

b) What are the various ways to manage online annoyances?

5

Q.4  a) What is the need of system software? Explain its advantages.

5
b) What are the basic trouble shooting techniques you do when your system does not start up?

PART-B

Q.5  a) What is a network architecture? Explain OSI network model in brief. 

5

b) What are the various steps to protect computers from the threats?

5

Q.6  a) What are the advantages of various built-in-functions in MS-excel? Explain all mathematical functions with proper syntax and suitable examples.

7

b) What is relative and absolute cell addressing?

3

Q.7  a) What is ‘mail merge’? Explain step-by-step process to perform mail merge with a suitable example.

5

b) Discuss various methods of applying slide animation and custom animation in a power point presentation.

5
End Semester Examination, May 2016

B. Sc. (Information Technology) – First Semester
Q.1 a) Name the different types of ROM.
b) Name their application layer protocols.
c) What is a URL?
d) Define DNS.
e) Virus are different from worms. How?
f) How to define COUNT in MS-EXCEL?
g) What is CPU?
h) What is mobile computing?
i) Name any three ports.
j) Define Netware.

PART-A
Q.2 a) What is the significance of computer in today’s world?  

b) Explain audio and video and compare them in detail.

Q.3 Define internet. Explain different internet technologies in detail with the help of examples.

Q.4 Identify computer hardware, peripherals and terminology in detail with examples.

PART-B
Q.5 a) What is network architecture? Define its types with an example in detail.
b) What are the different features of WINDOWS operating system? 

Q.6 Why we use MS-PowerPoint? How it help us in day to day life? What are the software and hardware requirement for the same?

Q.7 a) Write down 10 short cut keys used in MS-WORD. 

  b) What is Pivot Table? Give some examples where it.

  c) Why we use MS-ACCESS? How is it different from MS-EXCEL?
Q.1 **State whether TRUE or FALSE:**

a) Disturbances/distractions in the environment are a result of physical noise.

b) “Relevance” means adherence to a set of logically and sequentially arranged utterances.

c) Listening is equivalent to heaving with intelligent deciphering of the phonetic sounds being produced by the sender.

d) You can win others to your side an accomplish tasks by adopting an assistive stance.

**Choose the correct option:**

e) Errors in languages, grammar, or visual representation of facts take away:

   i) Clarity
   
   ii) Correctness
   
   iii) Crispness
   
   iv) Conciseness

f) “You are one of the sloppiest team members I have ever had” is Milind’s favorite catch-line. Little does he realize that his statement does put the receiver on hold as he is?

   i) Demonstrating egoistical trails.
   
   ii) Using a negative statement.
   
   iii) Stressing that he is the boss.

**g) Devender Mahajan, CEO, needs to get the rest of his group motivated in times of recession. His closing of a presentation should be as follows:**

   i) “Let us work together to achieve targets”.
   
   ii) “We will provide a bonus if you are able to achieve targets”.
iii) “Let us discuss what needs to be done”.
iv) None of the above.

h) Evading eye contact, as per the discussion with the professor, means:
   i) Shy
   ii) Not confident
   iii) Cultural trait
   iv) None of the above

i) Encoding in the process in which:
   i) The sender writes down the message in morse code.
   ii) The sender converts the ideas into message.
   iii) The receiver writes the message in brief.

j) The full form of KISS in relevance to communication is ____________. 1×10

**PART-A**

Q.2 a) How does communication help you at work and outside work? What are the benefits associated with effective communication? 6

b) What is the impact of using too much or too little information in one’s communication? 4

Q.3 a) How does one make one’s communication more receivers centric? 6

b) Mention the 7 C’s in communication. 4

Q.4 a) “Uniting the team and effective output from team can easily be done by good communication”. Elaborate. 6

b) What key points should be taken care of while giving an oral presentation? 4

**PART-B**

Q.5 a) What are the different ways to carry out written communication? 6

b) What is the importance of conducting meeting? 4

Q.6 a) “Nonverbal communication is as important as verbal communication”. Explain. 6
Q.7  a) “Visual communication is more effective and everlasting “, how?  5
b) Mention various advantages and disadvantages of internet.  5
Q.1  
   a) Define server explorer windows.
   b) Define variables.
   c) What is the property of text button? Name any two.
   d) Which function is used to read data from a text file?
   e) What are implicit and explicit conversions?
   f) Differentiate between a structure and a function.
   g) Differentiate between a listbox and a combobox.
   h) Differentiate between a run time and a compile time error.
   i) What is the role of solution window in visual studio?
   j) Define modularization.

   2x10

PART-A

Q.2  
   a) What makes a good programming language? Explain the attributes of a good language.
       5

   b) Explain the role of a programming language.
       5

   c) Write a short note on C# coding window.
       5
Q.3  a) What are the basic controls used in toolbox? Explain them with the help of properties of each control.

          10

  b) Explain various types of arithmetic operators with the help of examples.

          5

Q.4  a) Write a program in C# to add two matrices.

          10

  b) Explain conversion functions in C#.

          5

PART-B

Q.5  a) What are the steps follows in handling the error using try catch block?

          10

  b) What are the types of errors encountered in programming languages?

          5

Q.6  a) How can one process and modify the text file contents?

          5

  b) Explain recursive procedures in detail.

          5

  c) How can one process list of data with the help of do loop? Explain it with an example.

          5

Q.7  a) Explain in detail relational and logical operators with suitable examples.

          10

  b) What are the various keyboard and mouse events? Explain each of them in brief.

          5

End Semester Examination, May 2016

B. Sc. (Information Technology) – First Semester
FUNDAMENTALS OF COMPUTER PROGRAMMING (7.103)

Time: 3 hrs Max Marks: 120

No. of pages: 1

Note: Attempt FIVE questions in all; Q.1 is compulsory. Attempt any TWO questions from Part A and TWO questions from Part B. Each question carries equal marks.

Q.1 Explain any three:

a) Which feature of .NET framework makes it platform independent? Write a short note on the same.

b) Differentiate between C# and C++.

c) Differentiate syntax errors and semantic errors.

d) Compare: conditional operator and if (...) else statement.

8×3

PART-A

Q.2 a) What symbols are used in flowcharts and explain their uses also.

b) Write a flowchart for calculation of simple interest.

c) What do you mean by a pseudo code and explain its importance?

Q.3 a) What are the components of Common Language Runtime (CLR)? Explain with the help of an example.

b) What do you mean by IDE? What are the components of IDE?

c) Write four benefits of .NET framework.

Q.4 a) What do you mean by feasibility in software development? What are the types of feasibility?

b) Give any ten in-built string functions and write their uses.

c) What are keywords? Name any four keywords of C#.
PART-B

Q.5  a) Differentiate between while () and do...while () statement.  
     c) What is the use of switch () statement in C#. Justify with an example.

Q.6  a) Write a program in C# to implement a matrix multiplication. 
     b) Write a short note on if ()... else statement.

Q.7  a) Write a program in C# to sort a given list using arrays. 
     b) What is the difference between for () loop and for each () loop? Justify with an example.
     c) Write a short note on debugging.
Q.1 Write short notes on any two of the following:
   a) Data vs Information.
   b) Data Independence.
   c) Constraints in Sql.
   d) Joins.
   e) Normalization.

   **PART-A**

Q.2 Explain the advantages and disadvantages of database system over a file system.  

Q.3 Explain the following terms:
   a) Schema.
   b) Instance.
   c) Second Normal Form (2NF).
   d) Data Model.

Q.4 Explain the Third Normal Form (3NF) with the help of an example.

   **PART-B**

Q.5 Explain five DML statements with proper syntax and examples.

Q.6 Explain the following terms:
a) Primary Key.
b) Super Key.
c) View.
d) Index.

Q.7 What do you mean by business analysis? Explain the use of intelligent tools in the promotion of a business using an example.
Q.1  
   a) Is there any difference between internet and intranet? Explain.  
   b) List the application layer protocols.  
   c) Why do we need network security?  
   d) Define standardization. Which agency define the standards and protocols for the OSI model?  
   e) Define bandwidth, throughput and data rate.  
      2x5

PART-A

Q.2 Explain wireless LAN with its layers and frame formats. How are they different from wired LAN’s?  
      10

Q.3 Explain the OSI model. Name all the protocols which work on different layers of OSI model. How OSI model is different from TCP/IP model?  
      10

Q.4 How can a mobile network be implemented? Explain different generations of cellular networks.  
      10

PART-B

Q.5  
   a) Differentiate between connection-oriented and connectionless networking. Explain it with reference to TCP and UPD protocols.  
      5
b) What is the role of DNS in data communication? Support your answer with the help of an example.

Q.6 What are the performance issues involved in computer networking? Also explain distributed computer networks in brief.

Q.7 Write short note on:
   a) Network security
   b) IPV4
Time: 3 hrs

Max Marks: 50

No. of pages: 1

Note: Attempt **FIVE** questions in all; **Q.1 is compulsory.** Attempt any **TWO** questions from **Part A** and **TWO** questions from **Part B.** All questions carry equal marks.

Q.1 Write short notes on **(any five):**
   a) Define business environment.
   b) Write a brief note on economic system.
   c) International environment.
   d) “Business system is a part of economic system”. Explain this statement.
   e) What are the two types of organizational cultures?
   f) Foreign direct investment.

2x5

**PART-A**

Q.2 How internal environment of a business is affected by an organizational culture, structure and strategies? Explain your answer by taking an example.

10

Q.3 Discuss the role of customer relationship competitors and suppliers in the business environment.

10

Q.4 a) Describe any five differences among industry, commerce and trade.

5

b) Write any five strategies that affect the organization culture.

5

**PART-B**
Q.5 What are the exceptions to the law of demand? Explain them with examples.  

10

Q.6 Distinguish between the following:

a) Quantitative and qualitative barriers of trade.

b) Customs and manners.  

5x2

Q.7 “Technological advancements is an important tool for the successful growth of a business”. Justify your answer with the help of an example.  

10

End Semester Examination, May 2016

B. Sc. (Information Technology) - First Semester

MATHEMATICS FOR COMPUTING (7.107)
Q.1  a) Define Cartesian product with the help of an example.
    b) What is a square matrix?
    c) Define a directed graph.
    d) Give formula to calculate median of a grouped data.
    e) What do you mean by intersection of two sets?

2x5

PART-A

Q.2  If \( f, g : R \rightarrow R \) are defined respectively by:

\[
\begin{align*}
    f(x) &= 2x^2 + 2x - 1 \\
    g(x) &= 3x - 2
\end{align*}
\]

Find formula for the following:

a) \( fog \)  b) \( gof \)  c) \( fuf \)  d) \( gog \)  e) \( fof^2 \)

2x5

Q.3  If \( U = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\} \)

\[
\begin{align*}
    A &= \{8, 9, 10\} & B &= \{4, 5, 6, 7\} \\
    C &= \{3, 7, 8, 9, 10\} & D &= \{4, 8, 9, 10\}
\end{align*}
\]

Find the following:

a) \( (A - D) \cap (B \cap D) \)

b) \( (B \cap A) \cup C' \)

c) \( (A \cup B) \cup (B \cup D) \)
d) \((B - A) \cup (B \cap A) \cup C'\)

e) \((A' \cup B') \cup (D')\)

Q.4 Find the adjoint of the following matrix:

\[
A = \begin{bmatrix}
1 & 2 & 3 \\
2 & 3 & 2 \\
3 & 3 & 4
\end{bmatrix}
\]

Q.5 For the following data, find median, mode and standard deviation:

<table>
<thead>
<tr>
<th>Class interval</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-10</td>
<td>8</td>
</tr>
<tr>
<td>10-20</td>
<td>7</td>
</tr>
<tr>
<td>20-30</td>
<td>6</td>
</tr>
<tr>
<td>30-40</td>
<td>15</td>
</tr>
<tr>
<td>40-50</td>
<td>25</td>
</tr>
</tbody>
</table>

Q.6 Two cards are drawn from a pack of cards at random. What is the productivity that it will be?

a) a diamond and a heart.

b) a king and a queen.

Q.7 a) Define the following terms:
i) Path.

ii) Directed tree.

iii) Adjacency matrix.

2x3

b) Define a spanning tree. Draw all possible spanning trees of the graph given below:

```
\begin{center}
\begin{tikzpicture}
\node (a) at (0,0) [circle,fill,inner sep=1.5pt] {a};
\node (b) at (2,0) [circle,fill,inner sep=1.5pt] {b};
\node (c) at (4,0) [circle,fill,inner sep=1.5pt] {c};
\node (d) at (2,-2) [circle,fill,inner sep=1.5pt] {d};
\node (e1) at (1,1) [circle,fill,inner sep=1.5pt] {e_1};
\node (e2) at (3,1) [circle,fill,inner sep=1.5pt] {e_2};
\node (e3) at (2,-1) [circle,fill,inner sep=1.5pt] {e_3};
\node (e4) at (1,-2) [circle,fill,inner sep=1.5pt] {e_4};
\node (e5) at (3,-2) [circle,fill,inner sep=1.5pt] {e_5};
\draw (a) -- (e1);
\draw (e1) -- (b);
\draw (b) -- (e2);
\draw (e2) -- (c);
\draw (d) -- (e3);
\draw (e3) -- (e4);
\draw (e4) -- (a);
\draw (e3) -- (e5);
\draw (e5) -- (c);
\end{tikzpicture}
\end{center}
```
Q.1 Write short notes on (any two):
   a) Information reuse.
   b) Use case.
   c) Economic feasibility.  \[4 \times 2\]

**PART-A**

Q.2 How will you gather requirements for an information system? Discuss by taking a suitable example.  \[8\]

Q.3 What do you understand by an information system? What is the purpose of an information system?  \[8\]

Q.4 List various software models and also describe the two merits of each model.  \[8\]

**PART-B**

Q.5 What are the strategies of a business analyst? Discuss.  \[8\]

Q.6 How will you communicate the information requirement? What are the various information requirements?  \[8\]
Q.7 Draw a use case diagram of payroll management system.
Q.1 Write short notes on:
   a) Ad hoc networks.
   b) Bluetooth.  \[5 \times 2\]

**PART-A**

Q.2 What is multiplexing? What are the various types of multiplexing techniques? Explain with a diagram.  \[10\]

Q.3 a) Differentiate between soft, softer and hard handovers. \[5\]
   b) What are cellular networks? Explain with diagrams. \[5\]

Q.4 a) Differentiate between analog and digital signals. \[5\]
   b) What is phase and amplitude modulation? Explain with a diagram. \[5\]

**PART-B**

Q.5 What are IEEE 802.11 wireless networks? Explain the architecture of IEEE 802.11 in detail. \[10\]

Q.6 Write short notes on:
   a) Mobile IP \[5\]
What is wireless application protocol? Explain its architecture in detail.

End Semester Examination, May 2016

B. Sc. (IT) – Second Semester

ENGLISH FOR ACADEMIC PURPOSES-II B (EAP-II B)

Time: 3 hrs

Max Marks: 50

No. of pages: 4
Note: All questions are compulsory.

Q.1  Read the following passage carefully and answer the questions below:

Discovered in the early 1800s and named ‘nicotianine’, the oily essence now called nicotine is the main active ingredient of tobacco. Nicotine, however, is only a small component of cigarette smoke, which contains more than 4,700 chemical compounds, including 43 cancer-causing substances. In recent times, scientific research has been providing evidence that years of cigarette smoking vastly increases the risk of developing fatal medical conditions.

Greenhouse gases arise from a wide range of sources and their increasing concentration is largely related to the compound effects of increased population, improved living standards and changes in lifestyle. From a current base of 5 billion, the United Nations predicts that the global population may stabilise in the twenty-first century between 8 and 14 billion, with more than 90 per cent of the projected increase taking place in the world’s developing nations. The associated activities to support that growth, particularly to produce the required energy and food, will cause further increases in greenhouse gas emissions. The challenge, therefore, is to attain a sustainable balance between population, economic growth and the environment.

The major greenhouse gas emissions from human activities are carbon dioxide (CO2), methane and nitrous oxide. Chlorofluorocarbons (CFCs) are the only major contributor to the greenhouse effect that does not occur naturally, coming from such sources as refrigeration, plastics and manufacture. Coal’s total contribution to greenhouse gas emissions is thought to be about 18 per cent, with about half of this coming from electricity generation.

The worldwide coal industry allocates extensive resources to researching and developing new technologies and ways of capturing greenhouse gases. Efficiencies are likely to be improved dramatically, and hence CO2 emissions reduced, through combustion and gasification techniques which are now at pilot and demonstration stages.
Clean coal is another avenue for improving fuel conversion efficiency. Investigations are under way into super-clean coal (35 per cent ash) and ultraclean coal (less than 1 per cent ash). Super-clean coal has the potential to enhance the combustion efficiency of conventional pulverised fuel power plants. Ultraclean coal will enable coal to be used in advanced power systems such as coal-fired gas turbines which, when operated in combined cycle, have the potential to achieve much greater efficiencies.

Defendants of mining point out that, environmentally, coal mining has two important factors in its favour. It makes only temporary use of the land and produces no toxic chemical wastes. By carefully preplanning projects, implementing pollution control measures, monitoring the effects of mining and rehabilitating mined areas, the coal industry minimises the impact on the neighbouring community, the immediate environment and long-term land capability.

Dust levels are controlled by spraying roads and stockpiles, and water pollution is controlled by carefully separating clean water runoff from runoff which contains sediments or salt from mine workings. The latter is treated and reused for dust suppression. Noise is controlled by modifying equipment and by using insulation and sound enclosures around machinery.

Since mining activities represent only a temporary use of the land, extensive. Rehabilitation measures are adopted to ensure that land capability after mining meets agreed and appropriate standards which, in some cases, are superior to the land’s pre-mining condition. Where the mining is underground, the surface area can be simultaneously used for forests, cattle grazing and crop raising, or even reservoirs and urban development, with little or no disruption to the existing land use. In all cases, mining is subject to stringent controls and approvals processes.

Choose the right answer:

1. The global increase in greenhouse gases has been attributed to
   A industrial pollution in developing countries.
   B coal mining and electricity generation.
   C reduced rainfall in many parts of the world.
D trends in population and lifestyle.

2 The proportion of all greenhouse gases created by coal is approximately
   A 14 per cent.
   B 18 per cent.
   C 27 per cent.
   D 90 per cent.

3 Current research aims to increase the energy-producing efficiency of coal by
   A burning it at a lower temperature.
   B developing new gasification techniques.
   C extracting CO2 from it.
   D recycling greenhouse gases.

4 Compared with ordinary coal, new, ‘clean’ coals may generate power
   A more cleanly and more efficiently.
   B more cleanly but less efficiently.
   C more cleanly but at higher cost.
   D more cleanly but much more slowly.

5 To control dust at mine sites, mining companies often use
   A chemicals which may be toxic.
   B topsoil taken from the site before mining.
   C fresh water from nearby dams.
   D runoff water containing sediments
Q.2  Complete each sentence with a word from the list.

<table>
<thead>
<tr>
<th>dynamic</th>
<th>elegant</th>
<th>obstinate</th>
<th>unfavorable</th>
</tr>
</thead>
<tbody>
<tr>
<td>dishonest</td>
<td>obedient</td>
<td>irresponsible</td>
<td>Fearless</td>
</tr>
<tr>
<td>tolerance</td>
<td>impatient</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. I don't expect him to change his mind because I know he is very ----.

2. If you want to shop for the latest fashions or expensive souvenirs in New York City, go to Fifth Avenue. It is full of ---- shops.

3. Our teacher is a(n) ---- person, so she easily captivates the interest and attention of the students while she is teaching.

4. My father gets angry with us whenever we make a mistake. He has no ---- for mistakes.
5. Teachers like ---- students who never break their rules.

6. We couldn't see the meteor shower last night because of the ---- weather conditions.

7. You should wait for your turn. You'd better not be so ----.

8. Tom is so ----; he never does his homework and never keeps to his promises.

9. Sarven is so ---- that he sometimes puts his life at risk.

10. Mrs. Smith always tells her daughter not to marry a(n) ---- man, who lies and cheats.

Q.3 Writing Task 1

You will move to a new city for work. Write a letter to the hiring manager asking and informing the below mentioned points.

* Ask them for help finding accommodation
* Tell them where you would like to live
* Tell them the type of place you are looking for

You should write at least 250 words.

Q.4 Writing Task 2

Read the graph carefully. The two pie charts below show some employment patterns in Great Britain in 1992.
Summarize the information by selecting and reporting the main features, and make
comparisons where relevant.

Write at least 150 words.

Employees and self-employed: by sex and occupation, 1992

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