End Semester Examination, May 2015
BCA -Second Semester
LOGICAL ORGANISATION OF COMPUTER (BCA-2003)

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) A flip flop has:
      i) One stable state   ii) No stable state
      iii) Two stable states iv) None of the above
   b) Which is typically the longest: bit, byte, nibble word?
      i) Bit ii) Byte iii) Nibble iv) Word
   c) A JK flip flop is in a “no change” condition when:
      i) J=1 K=1   ii) J=1, K=0   iii) J=0, K=1   iv) J=0, K=0
   d) The clock signals are used in sequential logic circuits:
      i) to tell the time of the delay.
      ii) to tell how much time has elapsed since the system was turned on.
      iii) to carry serial digital signals.
      iv) to synchronize events in various parts of a system.
   e) The two parts of a microprocessor instruction are called operation and the:
      i) Operand ii) Operator
      iii) Observable iv) None of the above
   f) A combinational circuit which is used to change a decimal number into an equivalent BCD number is:
      i) Decoder ii) Encoder
      iii) Multiplexer iv) Demultiplexer
   g) A 20-bit address bus allows access to a memory of capacity:
      i) 1 MB ii) 2 MB
      iii) 32 MB iv) 64 MB
   h) When is a cache block written into the main memory?
      i) Valid bit is not set
      ii) Every cycle
      iii) Dirty bit is set
      iv) None of the above
   i) A microprocessor retries instructions from:
      i) Control memory
      ii) Cache memory
      iii) Main memory
      iv) Virtual memory
   j) A 32 bit microprocessor has the word length equal to:
      i) 2 bytes ii) 32 bytes
      iii) 4 bytes iv) 8 bytes

UNIT-I

Q.2 a) Why a binary number system is preferred for computers? Explain with reason.

P. T. O.
b) Perform the following:
   i) \((798.5)_{10}=(\_)_{16}=(\_)_{2}\)
   ii) \(79 - (32)\)

Q.3
a) Generate the Hamming code for data bits 1101.
b) Write short notes on:
   i) Non weighted code
   ii) Floating point numbers

**UNIT-II**

Q.4
What are universal gates? Simulate NAND and NOR gates to all gates.

Q.5
Simplify the following using K-map.
   a) \(F(A, B, C, D) = \sum(0, 3, 5, 6, 9, 11, 13, 14, 15)\)
      \(D(A, B, C, D) = \sum(1, 2, 8)\)
   b) \(F(w, x, y, z) = \pi(1, 5, 7, 9, 10, 12, 14)\)

**UNIT-III**

Q.6
What is the limitation of JK flip-flop? How can we overcome from them? Obtain the logic diagram of master slave flip-flop using NAND gates.

Q.7
Explain the followings:
   a) Multiplexers
   b) Full adder
   c) Decoder

**UNIT-IV**

Q.8
What is a cache memory? Explain various types of mapping techniques in detail.

Q.9
What is parallel processing? Explain in detail.
End Semester Examination, May 2015
BCA -Second Semester
DATABASE SYSTEMS (BCA-2002)

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  Answer the following by choosing the correct option:

a) A database schema refers to:
   i) Information at particular level
   ii) Overall design of database
   iii) Query language
   iv) Validation issues

b) Row is synonymous with the term:
   i) Record
   ii) Relation
   iii) Column
   iv) Field

c) Which of the following is a group of one or more attributes that uniquely identifies a row?
   i) Key
   ii) Determinants
   iii) Tuple
   iv) Relation

d) Traditional set operators include:
   i) Union
   ii) Selection
   iii) Projection
   iv) Division

e) Which structure is network model based on?
   i) Graph
   ii) Linked list
   iii) Domain
   iv) None of the above

f) Which of the following is not a type of SQL constraint?
   i) Primary key
   ii) Foreign key
   iii) Alternate key
   iv) Unique key

g) A functional dependency is a relationship between or among:
   i) Tables
   ii) Rows
   iii) Relations
   iv) Attributes

h) Read only databases are _______ updated.
   i) Always
   ii) Commonly
   iii) Increases
   iv) None of the above

i) A transaction completes its execution is said to be:
   i) Committed
   ii) aborted
   iii) Rolled back
   iv) Failed

j) In ER diagram, ER stands for:
   i) Entity-Record
   ii) Entity-Relationship
   iii) Entity-Row
   iv) All of the above.  

UNIT-I

Q.2 What is file based approach of database? Explain its limitations. How DBMS management system is better solution along with advantages and disadvantages of DBMS? 15

Q.3 What are the different notations used for designing an ER diagram and explain their usage? 15

UNIT-II

Q.4 Explain all types of keys used in relational model with a suitable database example. 15

Q.5 Discuss any 10 Oracle functions with proper syntax and suitable examples. 15
UNIT-III

Q.6 What is meant by normalization? Why do we normalize the database? Explain different techniques of normalization.

Q.7 Explain two-phase locking protocol with a suitable example in concurrency control.

UNIT-IV

Q.8 What is the importance of recovery procedure? What is meant by log-based recovery technique? Discuss different types of log based recovery techniques.

Q.9 What is meant by DDBMS? Compare DDBMS with DBMS and discuss advantages and disadvantages of DDBMS.
Q.1 **Answer the following by choosing the correct option:**

a) The smallest element of an array’s index is called its:
   i) Lower bound
   ii) Upper bound
   iii) Range
   iv) Extraction

b) Which of the following sorting algorithm is of divide and conquer type?
   i) Bubble
   ii) Quick
   iii) Insertion
   iv) All of the above

c) Which data structure allows deleting data elements from front and inserting at rear?
   i) Stack
   ii) Queries
   iii) Dequeue
   iv) All of the above

d) Linklist are not suitable for:
   i) Insertion sort
   ii) Binary search
   iii) Queue
   iv) None of the above

**Fill in the blanks:**

e) Two dimensional arrays are called __________.
f) Stack is based on the principle __________.
g) The front of the queries calculated by __________.

**State whether True or False:**

h) A binary tree can be converted into two tree by replacing each empty subtree by a new external node.
i) A connected graph T without any cycle is called neighbor.
j) A graph is a non linear data structure.

**UNIT-I**

Q.2 a) Suppose A is 2-dimensional array with 20 rows and 4 columns. Each element of array is stored in 4 memory locations if base address is 200. Calculate:
   i) A[12, 3] using row major
   ii) A[14, 2] using column major

b) Define the followings:
   i) Data
   ii) Information
   iii) Time complexity
   iv) Space complexity

Q.3 a) Explain sparse array. How can you store the sparse array in memory? Explain with an example.
b) Write an algorithm for inserting a new element into a linear array.

**UNIT-II**

Q.4 What do you understand by stack? Discuss the various operations of stack. Convert the infix notation into postfix notation $( (X - Y)/Z )^* ( (U + V) - W )$. 
Q.5  

a) Mention and explain various types of queue with examples.  
b) What are advantages and disadvantages of linked lists? How linked lists can be used for polynomial manipulation?

UNIT-III

Q.6  

a) From the given binary tree, answer the followings:

![Binary Tree Image]

i) Which is root node?
ii) Which are leaf nodes?
iii) What is the result of pre-order traversal?
iv) What is the result of post-order traversal?
v) What is the result of in-order traversal?

b) Write a short note on threaded tree.

Q.7  

What is minimum spanning tree? Write Kruskal algorithm for minimum spanning tree. Also, find the minimum spanning tree for the following:

![Graph Image]

UNIT-IV

Q.8  

a) Sort the following data using quick sort:  

b) Write an algorithm to search a particular element using binary search method.

Q.9  

What is hashing? Discuss various hashing techniques. Also, discuss the concept of collision resolution technique in detail.
End Semester Examination, May 2015  
BCA - First Semester  
BASIC MATHEMATICAL SKILLS (BCA-1004)

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 Rank of matrix.  
b) If \( k+1, 3k, 4k+2 \) be any 3 consecutive terms of an A.P., then value of \( k \) is _______.  
c) Solve \( \log \sqrt{8} / \log 8 \).  
d) Find \( \frac{dy}{dt} \) for \( y = x^9 \).  
e) The 9th term of AP sequence 9, 12, 15, 18......... is __________.  
f) If \( \left( \begin{array}{c} a \\ b \end{array} \right)^{x-1} = \left( \begin{array}{c} b \\ a \end{array} \right)^{-x} \), then the value of \( x \) is __________.

g) If \( A = \left[ \begin{array}{cc} 3 & 2 \\ 1 & 1 \end{array} \right] \) and \( AB = \left[ \begin{array}{cc} 1 & 3 \\ 1 & 2 \end{array} \right] \), then:  
i) \( B \) is not determined  
ii) \( B = \left[ \begin{array}{ccc} -1 & 1 & 0 \\ 2 & 0 & 1 \end{array} \right] \)  
iii) \( B = \left[ \begin{array}{cc} -1 & 2 \\ 1 & 0 \\ 0 & 1 \end{array} \right] \)  
iv) \( B = \left[ \begin{array}{c} -1 \\ 2 \end{array} \right] \)  
h) Fine the value of \( a \) if the following matrix is singular \( \left[ \begin{array}{cc} -4 & 2 \\ 6 & a \end{array} \right] \).  
i) Find cofactor of \( A_{23} \) of the matrix \( A = \left[ \begin{array}{ccc} 5 & -2 & 7 \\ 6 & 1 & -9 \\ 4 & -3 & 8 \end{array} \right] \)  
j) If \( A = \left[ \begin{array}{ccc} 5 & 3 & 2 \\ 0 & 4 & 1 \\ 0 & 0 & 3 \end{array} \right] \) the \( |A| \) is _______.  

UNIT-I

Q.2  a) If \( A = \left[ \begin{array}{cc} 0 & 3 \\ -7 & 5 \end{array} \right] \) and \( I = \left[ \begin{array}{c} 1 \\ 0 \end{array} \right] \), then find \( K \) so that \( KA^2 = 5A - 2I \)  
b) Find the value of \( x \) such that \( \left[ \begin{array}{ccc} 1 & 2 & 0 \\ 2 & 0 & 1 \\ 1 & 0 & 2 \end{array} \right] x = 0 \)  

Q.3  a) Verify Cayley-Hamilton theorem for matrix \( A = \left[ \begin{array}{ccc} 1 & 3 & 3 \\ 1 & 4 & 3 \\ 1 & 3 & 4 \end{array} \right] \) and hence find \( A^{-1} \).
b) Find the rank of matrix \[ A = \begin{bmatrix} 3 & 2 & 7 \\ 4 & -3 & -2 \\ 5 & 9 & 23 \end{bmatrix} \].

UNIT-II

Q.4   a) The sum of 3 numbers in A.P. is 15. If 1, 4 and 19 are added to the numbers, the resulting numbers are in G.P. Find the numbers.

b) How many words can be formed from the letters of the word DAUGHTER?
   i) Taking all letters together
   ii) Beginning with D and ending with R

Q.5   a) Find the 8th term in \[ \left[ \frac{2x}{3} - y^2 \right]^{11} \]

b) Sum the series 5+55+555+…… to n terms.

UNIT-III

Q.6   a) Show that \[ 2 \log x + 2 \log x^2 + 2 \log x^3 + \ldots + 2 \log x^n = n(n+1) \log x \]

b) Simplify: \[ \tan(90 + \theta) \sin(180 + \theta) \sec(270 + \theta) \csc(360 - \theta) \cos(270 - \theta) \cot(180 - \theta) \sin(90 - \theta) \tan(360 \theta) \]

Q.7   a) If ABCD is a cyclic quadrilateral, Prove that \[ \cos A + \cos B + \cos C + \cos D = 0 \]

b) If \[ \log \frac{x + y}{7} = \frac{1}{2} (\log x + \log y) \]; Show that: \[ \frac{x}{y} + \frac{y}{x} = 47 \]

UNIT-IV

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

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

b) If \( y = \sqrt{x} - \frac{1}{\sqrt{x}} \), Show that \[ 2x \frac{dy}{dx} + y = 2\sqrt{x} \]

Q.9   a) If \( y = \frac{x}{x + y} \), show that \[ x \frac{dy}{dx} = y(1 - y) \]

b) If \[ \lim_{x \to 0} \frac{x^4 - 1}{x - 1} = \lim_{x \to 0} \frac{x^2 - k^3}{x^2 - k^2} \] find the value of \( k \)
End Semester Examination, May 2015
BCA - First Semester
ENVIRONMENTAL STUDIES (BCA-1003)

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/fill the correct option:

a) Which of these is not a natural ecosystem?
   i) Desert  ii) Aquarium  iii) Forest  iv) Mountain

b) Which of these is a threat to environment?
   i) Growing plants  ii) Growing population  
   iii) Growing crops  iv) Growing flowers

c) The interactive zone between land, air and water is called:
   i) Aquarium  ii) Lithosphere  iii) Biosphere  iv) Atmosphere

d) The word ‘Environment’ is derived from a French word ‘Environ’ which means 

   e) The thinnest layer of the earth is:
      i) The core  ii) The mantle  iii) The lithosphere  iv) The crust

f) What is the composition of oxygen in the atmosphere?
   i) 20%  ii) 21%  iii) 22%  iv) 23%

g) The group of organisms which convert light into food are called:
   i) Autotrophs  ii) Heterotrophs  iii) Decomposers  iv) Omnivores

h) BOD stands for:
   i) Biotic oxidation demand  ii) Biological oxidation demand  
      iii) Biological oxygen demand  iv) Biochemical oxygen demand

i) 5th June is observed as:
   i) World forest day  ii) World environment day  
      iii) World Wildlife day  iv) World Population day

j) The hormone responsible for maintaining the pregnancy is:
   i) LH  ii) FSH  iii) Progesterone  iv) Oestrogen

   1½ x 10

UNIT-I

Q.2 a) Why do we need to study environmental studies?  

b) Explain the role of an individual in conservation of natural resources.

Q.3 a) What do you mean by equitable use of resources for sustainable lifestyle?  

b) What do you mean by Natural resources? What are the associated problems with 
   natural resources?

UNIT-II

Q.4 a) Explain the energy flow in an ecosystem with an example.

b) Explain the structure and function of an ecosystem.
Q.5  a) Write a note on “India as a mega-diversity nation”.  
     b) Explain conservation of biodiversity.  

UNIT-III

Q.6  Give causes, effects and control measures of any three:  
     a) Nuclear hazards  b) Air pollution  
     c) Water Pollution  d) Soil pollution  

Q.7  a) What do you mean by a disaster management? Explain with relation to  
     earthquakes and landslides.  
     b) How solid waste can be managed in urban areas and in industries?  

UNIT-IV

Q.8  a) Why environment needs to be protected? Explain different Environment Protection  
     Acts.  
     b) Write a note on Urban problems related to energy.  

Q.9  a) Explain how economy of India has got affected by population explosion.  
     b) Explain different methods to prevent pregnancy.
End Semester Examination, May 2015
BCA - First Semester
PROGRAMMING IN ‘C’ (BCA-1002)

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) C language was developed by:
   i) Ken Thompson
   ii) Dennis Ritchie
   iii) Peter Norcross
   iv) None of the above
b) The two operators && and || are:
   i) Arithmetic
   ii) Logical
   iii) Relational
c) When we use the case control structure?
   i) To choose one from multiple alternatives.
   ii) To switch from one instruction to another.
   iii) To make execution fast.
   iv) None of the above.
d) The expression \( X = 4 + 2 \% 8 \) evaluates:
   i) -6
   ii) 6
   iii) 4
   iv) None of the above
e) The single character input/output functions are:
   i) scanf and printf
   ii) getchar and putchar
   iii) None of the above
f) \#define should not end with a semicolon. (True / False)
g) A variable which is visible only in the function, in which it is defined is called local variable. (True / False)
h) A C variable cannot start with a number. (True / False)
i) Which escape character can be used to begin a new line in C?
j) Which of the language is predecessor to C programming language? 1½x10

UNIT-I

Q.2 a) Write a program in C language to find area of a triangle. 5
b) What are the reasons of popularity of C over other programming languages? 5
c) Write short note on constant. 5

Q.3 What is operator? Discuss various types of operators available in C language. Give an example of each. 15

UNIT-II

Q.4 Write the format, purpose and example of following:
   a) for loop
   b) while loop
   c) else-if ladder 15

Q.5 a) Give the syntax of declaring Arrays in C language with examples. 8
b) Write a program in C to generate the Fibonacci series upto \( n \) terms. 7

UNIT-III

Q.6 a) Highlight the differences between Structure and Union. 5
b) Explain with the help of an example how a structure is declared and initialized? 5
c) Distinguish between formal and actual parameters with examples. 5
Q.7  a) Explain general syntax of C function with an example.  
     b) What is recursion? While writing any recursive function what things must be taken care of?  

Q.8  a) Distinguish between: 
     i) `printf()` and `fprintf()`  
     ii) `scanf()` and `fscanf()`  
     b) Discuss: `fopen()` and `fclose()` functions.  
     c) What is the purpose of `rewind()`?  

Q.9  a) Discuss the various modes of opening a data file in C.  
     b) Write a note on storage classes.
End Semester Examination, May 2015
BCA -First Semester
FUNDAMENTALS OF INFORMATION TECHNOLOGY AND PROGRAMMING TECHNIQUES (BCA-1001)

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) A computer program that converts assembly language to machine language is:
      i) Compiler
         ii) Interpreter
         iii) Assembler
         iv) Comparator

   b) ALU is:
      i) Arithmetic logic unit
         ii) Array logic unit
         iii) Application logic unit
         iv) None of the above

   c) The term gigabytes refers to:
      i) 1024 mega bytes
         ii) 1024 kilobytes
         iii) Application logic unit
         iv) None of the above

   d) The secondary storage devices can only store data but they cannot perform:
      i) Arithmetic operation
         ii) Logic operation
         iii) Fetch operation
         iv) Either of the above

   State whether the following statements are True or False:
   e) Debugging means detecting, locating and removing all errors in a computer program.
   f) Structured programming do not follow modular approach.
   g) WORM stands for write once read many.
   h) ROM and RAM are secondary storage units.
   i) VOICE system are output devices.
   j) Condition stub and action stub form a decision table.

Q.2 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.

UNIT-I

Q.3 Write down the applications of computers in the following fields:
   a) Banking   b) Medicine   c) Sports   d) Airline   e) Weather

UNIT-II

Q.4 What do you understand by semi-conductor memory and magnetic memory? What are the similarities between the two? Also specify the major differences between the two.

Q.5 Perform the following conversions:
   a) \((172)_{10} = (?)_2\)
   b) \((10110110101)_{2} = (?)_{10}\)
   c) \((FCA)_{16} = (?)_2\)
d) \((7952)_8 = (?)_{10}\)

e) \((4459)_{10} = (?)_8\)

**UNIT-III**

Q.6 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.

Q.7 Write down the algorithm and also draw the flowchart for printing a Fibonacci series.

**UNIT-IV**

Q.8 Explain the approach which uses reverse engineering technique to solve the problem. Mention its relative advantages and disadvantages. Compare it with black box technique.

Q.9 Which technique is popularly known as modular approach of programming? Explain its concept with a suitable example. Also mention its advantages and disadvantages.
End Semester Examination, May 2015
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) Graphics that contain movement are often referred to as ___________.
      i) Animation  ii) Motion
      iii) Premier adobe  iv) Flash
   b) JPEG stands for:
      i) Joint photographic experts grade.
      ii) Joint photo experiment group.
      iii) Joint photographic enlarge group.
      iv) Joint photographic experts group.
   c) What is the primary logical unit for data storage in a CD?
      i) Groove  ii) Pit
      iii) Sector  iv) Track
   d) One of the disadvantages of multimedia is:
      i) Cost  ii) Adaptability
      iii) Relativity  iv) Usability
   e) Which of the following is not a video file extension?
      i) MP4  ii) AVI
      iii) QT  iv) JPG
   f) Video is represented as a series of images formally known as:
      i) Pics  ii) Shots
      iii) Frames  iv) Snaps
   g) __________ is a technique in which one image transforms into another:
      i) Kinematics  ii) Morphing
      iii) Animation  iv) Layering
   h) __________ is a decision making process about when user should admitted or not.
      i) Admission control  ii) Delay
      iii) Stand alone  iv) Synchronization
   i) In cryptography, cipher text refers to __________.
      i) Plain text  ii) Formatted text
      iii) Clean text  iv) Rich text
   j) Which one is a 3D animation software?
      i) Adobe Photoshop  ii) Microsoft silver light
      iii) Animation  iv) Toon Boom

UNIT-I

Q.2 a) Explain about the multimedia system architecture in detail. 10
b) What are the objects of multimedia? 5

Q.3 a) What are the advantages and disadvantages of multimedia? 8
b) List out the basic software of multimedia and categorise them. 7

UNIT-II
Q.4  
   a) List out the differences between a plain text and a formatted text.  
   b) What is OLE? Explain in detail.

   5
doctor

Q.5  
   a) Write a short note on conversion in various text formats.  
   b) Explain RTE syntax in detail.  
   c) List all the tools used in HTML.

   5x3

UNIT-III

Q.6  
   a) Differentiate between Lossless and Lossy compression techniques.  
   b) How data compression is possible?  
   c) Write a short note on bitmap image.

   5x3

Q.7  
   a) Explain one of entropy encoding technique with an example.  
   b) List some file formats used in multimedia.

   10

UNIT-IV

Q.8  
   a) Discuss the principle of animation.  
   b) List some 2D and 3D software. Also explain the 2D and 3D animation techniques.

   10

Q.9  
   Write short notes on:  
   a) Morphing.  
   b) Use of animation in multimedia.  
   c) Image size on quality and storage.

   5x3
Q.1  a) A tree topology is a variation of a ________ topology.
   i)  Mesh
   ii) Star
   iii) Bus
   iv) Ring
   b) A television broadcast is an example of ________ transmission.
   i)  Simplex
   ii)  Half duplex
   iii) Full duplex
   iv)  Automatic
   c) ARQ stands for ________.
   i) Automatic repeat quantization
   ii) Automatic repeat request
   iii) Automatic retransmission request
   iv) Acknowledge repeat request
   d) DNS is the abbreviation of:
   i)  Dynamic name system
   ii) Domain name system
   iii) Dynamic network system
   iv) Domain network service
   e) ________ control refers to methods of error detection and correction.
   i)  Flow
   ii) Error
   iii) Transmission
   iv) None of the above
   f) Frame relay provides ________ connections.
   i)  PVC
   ii) SVC
   iii) DLCI
   iv) Both i) and ii)
   g) Routers functions is the ________ layer.
   i)  Physical
   ii) Data link
   iii) Network
   iv) Transport
   h) In FTP, when we ________, it is copied from the client to the server.
   i)  Retrieve a file
   ii) Store a file
   iii) Retrieve a list
   iv) None of the above
   i)  ________ is the protocol suite for the current internet.
   i) TCP/IP
   ii) NCP
   iii) UNIX
   iv) ACM
   j) Which of the following is not in OSI model?
   i)  Physical layer
   ii) Internet layer
   iii) Network layer
   iv) Transport layer

**UNIT-I**

Q.2  What do you mean by sampling? Explain PAM and PCM in sampling with a proper diagram.

Q.3  Differentiate the following:
   a) Analog and digital signal.
   b) Bus and ring topology.
   c) Bitrate and band rate.
UNIT-II

Q.4 Differentiate between OSI model and TCP/IP model. Explain network layer and presentation layer of OSI model.  

Q.5 Write short notes on: 
   a) UDP 
   b) SMTP 
   c) FTP  

UNIT-III

Q.6 What do you mean by routing? How is distance vector routing different from link state routing?  

Q.7 What are virtual LANs? How are they different from LANs? State advantages and disadvantages of virtual LANs.  

UNIT-IV

Q.8 Explain token ring concept in relation to priority, reservations, monitor stations and backup stations etc.  

Q.9 What is packet switching? How a datagram approach is different from a virtual circuit approach? Justify your answer.
Q.1 Multiple choice questions:
   a) The overloaded constructors in a class will have:
      i) different names
      ii) different parameter lists
      iii) different return types
      iv) None of the above
   b) To create our own exception class, we have to:
      i) create an own try and catch block
      ii) extend exception class
      iii) use throws keyword
      iv) use finally keyword
   c) Which keyword is used to monitor statement for execution?
      i) try
      ii) catch
      iii) throw
      iv) throws
   d) Which method is called first by an applet?
      i) start
      ii) run()
      iii) init()
      iv) paint()
   e) To display text on applet, _______ method is used.
   f) Java always provides a default constructor to a _______.
   g) What is Garbage collection in Java?
   h) Why do we use array as a parameter in main method?
   i) What is package?
   j) What is method overriding?

UNIT-I

Q.2 a) What is the difference between Java, C and C++?
   b) Explain the importance of JVM in Java programming.
   c) What is stand alone application?

Q.3 a) Discuss the structure of Java program.
   b) Discuss the various tools available in JDK? How do they help in application development?

UNIT-II

Q.4 a) Write a program in Java to find the addition and subtraction of two matrices.
   b) Compare:   a) break and continue   b) while and do-while.

Q.5 a) What is an array? Give the format and purpose of arrays in Java.
   b) Write a program in Java to find sum and reverse of n digit numbers.

UNIT-III

Q.6 a) What are constructors used for? Can constructors be overloaded? Write a program in support of your answer.
   b) What are classes and objects? How does classes accomplish data hiding? Explain
Q.7  a) What is the difference between final, finalize and finally() in Java?  
   b) Discuss Java error handling mechanism with an example. What is the difference  
      between checked and unchecked exception handling in Java.  

UNIT-IV

Q.8  a) What is an interface? How is it different from an abstract class? Can an abstract  
class have constructors? Explain.  
   b) Define the following for packages:  
      i) - Public - private - protected  
         - import  

Q.9  a) What is the difference between shadowing and overriding in C#.net?  
   b) Write a short note on Delegation Event Model.  
   c) What are applets? Differentiate them from application.  

5x3
End Semester Examination, May 2015
BCA -Fifth Semester
NUMERICAL ANALYSIS AND STATISTICS (BCA-504)

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 formula of Regula-Falsi method for solving non-linear equations.
b) Using Newton Raphson method construct a formula to find square root of a number N.
c) What do you mean by initial value problem?
d) Write down the relation between the operators E and ∇.
e) Write down Bessel’s interpolation formula.
f) Define divided differences.
g) State centered formula of order \( O(h^2) \) for numerical differentiation.
h) Write down expression for Simpson’s three-eighth rule for numerical integration.
i) What is binomial distribution for a variate \( X \)?
j) Calculate \( P(-1 \leq z \leq 1) \) for standard normal variate \( z \).

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

UNIT-I

Q.2  a) Derive an iteration formula to solve \( x^3 + x^2 - 1 = 0 \) and hence solve the equation. 8
b) Derive Newton-Raphson Formula to solve non-linear equations. 7

Q.3  a) Solve the initial value problem:
\[
\frac{dy}{dx} = \frac{y-x}{y+x}, \quad y(0) = 1
\]
For \( x = 0.1 \) by Euler’s method. 7
b) Apply Runge-Kutta method to solve \( \frac{dy}{dx} = x^2 + y^2, \ y(0) = 1 \).
For \( x = 0.1 \). 8

UNIT-II

Q.4  a) The area \( A \) of a circle of radius \( d \) is given for the following values:

<table>
<thead>
<tr>
<th>( d )</th>
<th>80</th>
<th>85</th>
<th>90</th>
<th>95</th>
<th>100</th>
</tr>
</thead>
<tbody>
<tr>
<td>( A )</td>
<td>5026</td>
<td>5674</td>
<td>6362</td>
<td>7088</td>
<td>7854</td>
</tr>
</tbody>
</table>

Calculate the area of a circle of radius 105. 7
b) Using the table given below and Newton’s Divided difference formula, find \( f(x) \) as a polynomial in \( x \):

<table>
<thead>
<tr>
<th>( x )</th>
<th>-1</th>
<th>0</th>
<th>3</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>( f(x) )</td>
<td>3</td>
<td>-6</td>
<td>39</td>
<td>822</td>
<td>1611</td>
</tr>
</tbody>
</table>

8

Q.5  a) Using Lagrange’s formula, find the interpolating polynomial for \( (0,2), (1,3), (2,12) \) and \( (5,147) \). 9
b) Construct Newton’s divided difference table for the data:

<table>
<thead>
<tr>
<th>$x$</th>
<th>-4</th>
<th>-1</th>
<th>0</th>
<th>2</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>$y$</td>
<td>1245</td>
<td>33</td>
<td>5</td>
<td>9</td>
<td>1335</td>
</tr>
</tbody>
</table>

UNIT-III

Q.6  

a) Find the least square fit $y = a + bx + cx^2$ for the data:

<table>
<thead>
<tr>
<th>$x$</th>
<th>-3</th>
<th>-1</th>
<th>1</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>$y$</td>
<td>15</td>
<td>5</td>
<td>1</td>
<td>5</td>
</tr>
</tbody>
</table>

b) Using centered formula of order $(h^4)$, Find $f'(1.4)$ from the following table:

<table>
<thead>
<tr>
<th>$x$</th>
<th>f($x$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.2</td>
<td>1.5095</td>
</tr>
<tr>
<td>1.3</td>
<td>1.6984</td>
</tr>
<tr>
<td>1.4</td>
<td>1.9043</td>
</tr>
<tr>
<td>1.5</td>
<td>2.1293</td>
</tr>
<tr>
<td>1.6</td>
<td>2.3756</td>
</tr>
</tbody>
</table>

Q.7  

a) Using Simpson’s one-third rule, Compute $\int_0^1 \frac{1}{1+x} \, dx$.

Taking $h = 0.125$.

b) A river is 80 feet wide. The depth $y$ in feet of the river at a distance $x$ from one bank is given by the following table:

<table>
<thead>
<tr>
<th>$x$</th>
<th>0</th>
<th>10</th>
<th>20</th>
<th>30</th>
<th>40</th>
<th>50</th>
<th>60</th>
<th>70</th>
<th>80</th>
</tr>
</thead>
<tbody>
<tr>
<td>$y$</td>
<td>0</td>
<td>4</td>
<td>7</td>
<td>9</td>
<td>12</td>
<td>15</td>
<td>14</td>
<td>18</td>
<td>3</td>
</tr>
</tbody>
</table>

Find approximately the area $A = \int y \, dx$ of the cross section of the river.

UNIT-IV

Q.8  

a) A coin is tossed five times. What is the probability of getting at least three heads?

b) Fit a Poisson distribution to the following data:

<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>$f$</td>
<td>122</td>
<td>60</td>
<td>15</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

Q.9  

Fit a normal distribution to the following data and test the goodness of fit:

<table>
<thead>
<tr>
<th>$x$</th>
<th>4</th>
<th>6</th>
<th>8</th>
<th>10</th>
<th>12</th>
<th>14</th>
<th>16</th>
<th>18</th>
<th>20</th>
<th>22</th>
<th>24</th>
</tr>
</thead>
<tbody>
<tr>
<td>$y$</td>
<td>1</td>
<td>7</td>
<td>15</td>
<td>22</td>
<td>35</td>
<td>43</td>
<td>38</td>
<td>20</td>
<td>13</td>
<td>5</td>
<td>1</td>
</tr>
</tbody>
</table>
Q.1 a) __________ parameter is used in circle function.
   i) 3.  ii) 2.  iii) 4.  iv) None of the above.

b) __________ function is used to set the color of an image.
   i) Setbk color.  ii) Set color.  iii) Floodfill.  iv) None of the above.

c) There is ________ type of projection.
   i) 3.  ii) 1.  iii) 7.  iv) 4.

d) The transformation in which an object can be rotated about origin as well as an
   arbitrary point is called as:
   i) Translation.  ii) Scaling.  iii) Rotation.  iv) All of the above.

e) Two consecutive scaling transformation t1 and t2 are:
   i) Additive.  ii) Subtractive.  iii) Multiplicative.  iv) None of the above.

f) Some common form of clipping includes:
   i) Curve clipping.  ii) Polygon clipping.  iii) Point clipping.  iv) All of the above.

g) The transformation that produces a parallel mirror image of an object is called:
   i) Reflection.  ii) Shear.  iii) Rotation.  iv) Scaling.

h) The flat panel displays are ________ in appearance.
   i) flat.  ii) Curve.  iii) Both i) and ii).  iv) None.

i) The speed of printing in inkjet printer is:
   i) Fast.  ii) Slow.  iii) Neither fast nor slow.  iv) None of these.

j) CRT stands for:
   i) Cathode Ray Tube.  ii) Cannon Ray Tube.  iii) Check Ray Tube.  iv) None of the above.

UNIT-I

Q.2 What do you mean by computer graphics? Explain different types of computer
   graphics along with its architecture.  

Q.3 a) Explain input-output devices in details.
     b) Explain the different methods of color generation in details.

UNIT-II

Q.4 Explain the DDA algorithm for a line drawing. What would be the intermediate point
to draw a line between (2, 6) and (8, 12)?
Q.5  What do you mean by transformation? Explain different types of transformation with examples.  

**UNIT-III**

Q.6  Derive the transformation matrix to scale a unit cube twice uniformly w.r.t. origin. Find the coordinate of transformed cube.  

Q.7  a) Differentiate between cavalier and cabinet projection. Why cabinet projection is more realistic than cavalier projection?  
   b) What do you mean by 3D? How is it different from 2D? Explain through an example.  

**UNIT-IV**

Q.8  Explain the use of the following graphic functions with their syntax and examples:  
   a) arc()  
   b) getbkcolor()  
   c) initgraph()  
   d) detectgraph()  
   e) cleardevice()  
   f) closegraph()  
   g) setfillstyle()  
   h) outtext()  
   i) rectangle()  
   j) Fillpoly()  

Q.9  Write a program to generate /design a solar system.
End Semester Examination, May 2015
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) Software mistakes during coding are known as:
      i) Failures.         ii) Defects.
      iii) Bugs.          iv) Errors.
   b) Spiral model was developed by:
      i) Bev Littlewood.  ii) Berry Boehm.
      iii) Roger Pressman. iv) Victor Basili.
   c) If requirements are frequently changing which model is to be selected?
      i) Waterfall.       ii) Prototyping model.
      iii) Spiral model.  iv) Iterative enhancement model.
   d) Software engineering approach is used to achieve:
      i) Better performance of hardware
      ii) Error free software.
      iii) Reusable software.
      iv) Quality software product.
   e) Cost estimation for a project may include:
      i) Software cost.   ii) Hardware cost.
      iii) Personnel costs iv) All of the above.
   f) Temporal cohesion means:
      i) Cohesion between temporary variables.
      ii) Cohesion between local variables.
      iii) Cohesion with respect to time.
      iv) Coincidental cohesion.
   g) The relationship of data elements in a module is called:
      i) Coupling.        ii) Cohesion.
      iii) Modularity     iv) None of the above.
   h) During validation:
      i) Process is checked
      ii) Product is checked
      iii) Developers performance is evaluated
      iv) The customer checks the product.
   i) Alpha testing is done by:
      i) Customer.        ii) Tester.
      iii) Developer.     iv) All of the above.
   j) Cyclomatic complexity is denoted by:
      i) \( V(G) = e-n+2P \).
      ii) \( V(G) = \tau +1 \).
      iii) \( V(G) = \) number of regions of the graph
      iv) All of the above.

1½x10
UNIT-I
Q.2 Discuss prototype model. What is the effect of designing a prototype on the overall cost of a software project? What are the advantages of developing prototype of a system? 15

Q.3 a) Define the term software engineering. Discuss the techniques of software engineering. 8
b) What is more important: Product or process? Justify the answer. 7

UNIT-II
Q.4 a) Consider a project with the following functional units:
   No. of user inputs: 50
   No. of user outputs: 40
   No. of user enquiries: 35
   No. of user files: 06
   No. of external interfaces: 04
   Assume all complexity adjustment factors and weighting factors are average.
   Compute function points for the project. 8
b) Write a short note on PERT. 7

Q.5 Write short notes on the following:
a) LOC.
b) Token count.
c) SRS. 5x3

UNIT-III
Q.6 Discuss COCOMO model with their types in detail. 15

Q.7 a) Differentiate between coupling and cohesion. 8
b) How many types of coupling are available? What is the effect of coupling on effective modular design? 7

UNIT-IV
Q.8 a) Define error, bug, fault, defect and failure. 8
b) What is importance of testing? 7

Q.9 a) Describe equivalence class partitioning method. Compare this with boundary value analysis technique. 8
b) Why does software testing need extensive planning? 7
End Semester Examination, May 2015
BCA -Fifth Semester
INFORMATION AND COMMUNICATION TECHNOLOGY (BCA-501)

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) Fill in the blanks:
   i) Tele-working mean __________.
   ii) The digital divide is a ________.
   iii) EFTPOS is __________.
   iv) A cyber crime is ________.
   v) Full form of EDI is ________.

b) State four methods of protecting the security of a computer network. 2

c) Name three categories of cyber criminals. 1½

d) What is the network service which may be improved through the use of network audit software? 2

e) Define digital signature. 2

**UNIT-I**

Q.2 Explain Bluetooth technology. Compare Bluetooth with Wi-Fi. Are the two terms similar to each other? If they are different then list the points of difference. 15

Q.3 How can we maintain address book on the internet? List the various advantages of maintaining address book in a correct order. 15

**UNIT-II**

Q.4 Is there any difference between Wiki and Wikipedia? Write down the steps to upload an article in Wikipedia. Who maintain Wikipedia? 15

Q.5 Explain the concept of E-mail. State the requirement of having an email. State the advantages and disadvantages of email. List some email supporting websites and softwares. 15

**UNIT-III**

Q.6 Discuss the followings:
   a) Phishing
   b) Software privacy
   c) Copywriting 5x3

Q.7 “A network service may be improved through the use of network audit software”.  
a) Explain why network audit software is used? 8

Q.8 Give a detailed note on control applications like turtle graphics, control of flights, buzzers, motors, burglar alarms, automatic washing machines and microwaves. 15

Q.9 Discuss the ICT application in booking system and manufacturing industry. 15
End Semester Examination, May 2015
BCA -Fourth Semester
BUSINESS COMMUNICATION-II (BCA-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:

a) Generally speaking in business we communicate:
   i) Only to inform                   ii) To both persuade and inform
   iii) Only to persuade               iv) Only to entertain

b) Effective communication is essentially a:
   i) Two-way process                  ii) Three-way process
   iii) Both a one-way and a two-way process
   iv) One way process.

c) Speakers usually experience difficulty in ensuring that the message is:
   i) Conveyed precisely, understood correctly, and acted upon promptly and as desired.
   ii) Conveyed precisely.
   iii) Understood correctly.
   iv) Acted upon promptly and as desired.

d) The purpose of public relations is:
   i) To sell the company’s products.
   ii) To communicate with shareholders.
   iii) To project a favorable image of the company among various publics.
   iv) To communicate during a crisis.

e) Which of the following is not an indication of active listening?
   i) Egocentrism.
   ii) Engaging in conversation with the speaker.
   iii) Taking notes.
   iv) Reconstructing the information.

f) An impromptu speech means:
   i) A prepared speech delivered without any supporting aids.
   ii) A speech delivered without any preparation.
   iii) A speech delivered while referring to notes.
   iv) A speech delivered by reading from notes.

g) “A meeting without an agenda is like a ship without a destination”. This means that the meeting:
   i) Has no goal                     ii) Lacks leadership
   iii) Is inconclusive               iv) Is disorganized

h) A common method of measuring attitudes is by using:
   i) In-depth interviews.
   ii) Observing people’s behavior.
   iii) Semantic differential scales.
   iv) A lie detector.

i) The centrality of an attitude reflects:
   i) A person’s degree of negative or positive feelings about an object.
   ii) The extent to which an attitude is related to a person’s other attitudes.
   iii) The extent to which an attitude is a part of a person’s concept of self.
iv) The attitude’s resistance to change.

j) Reena is twice as old as Sunita. Three years ago, she was three times as old as Sunita. How old is Reena now?
   i) 6 years  ii) 12 years  iii) 14 years  iv) 16 years

UNIT-I

Q.2  a) Differentiate between verbal and non-verbal communication.  8
    b) Explain the term emotional intelligence. How is it helpful in extracting best form employees?  7

Q.3  a) What are the different levels of communication? Explain in detail.  8
    b) “It is very important to be a team player”. Elaborate.  7

UNIT-II

Q.4  a) How being an optimist different from being a pessimist? Elaborate.  8
    b) Explain an incident where being optimist has helped you in real life.  7

Q.5  Solve the followings:
    a) If a 36 inch long strip cloth shrinks to 33 inches after being washed, how many inches long will the same strip remain after washing if it were 48 inches long?
    b) The price of Maruti car rises by 30% while the sales of the car come down by 20%. What is the percentage change in total revenue?
    c) The total of the ages of Amar, Akbar and Anthony is 80 years. What was the total of their ages five years ago?
    d) A pineapple costs Rs. 7 each. A watermelon costs Rs. 5 each. X spends Rs. 38 on these fruits. The no. of pineapple purchased are ________?
    e) What is the product of all the numbers in the dial of a telephone?  3x5

UNIT-III

Q.6  a) What are the key considerations while designing a professional presentation?  8
    b) “A presentation is prepared based on understanding of audience and the speaking occasion”. Elaborate.  7

Q.7  a) Why do we need brainstorming before designing a presentation? How does it improve the standard of presentation?  8
    b) How developing a logical sequence for your message leaves a better impact on the audience? Explain.  7

UNIT-IV

Q.8  a) “Interviews play a crucial role for the employee and the employer”. Explain.  8
    b) List the various documents that you need to carry while going for an interview.  7

Q.9  a) What are the different types of interviews conducted in an organization? Which type of interview is best suited when the company is situated abroad?  8
    b) How performance appraisal plays a very important role in the growth of an individual in an organization?  7
End Semester Examination, May 2015  
BCA -Fourth Semester  
WEB DESIGNING AND INTERNET APPLICATIONS (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) IP addresses are converted into:  
i) Binary string  
ii) Alphanumeric string  
iii) Hierarchy of domain  
iv) Hexadecimal string  
b) The tag used in HTML to link other URL is:  
i) <A>  
ii) <H>  
iii) <U>  
iv) <L>  
c) A web page is located using:  
i) Universal record linking.  
ii) Universal resource locator.  
iii) Universal record locator.  
d) Which tag is used to arrange tags in paragraphs?  
i) <par>  
ii) <paragraph>  
iii) <P>  
iv) <a>  
e) HTML stands for:  
i) Hypertext making links  
ii) Hypertext markup language  
iii) Higher textual making of links  
iv) Hyper text mixer of links  
f) CSS stands for:  
i) Control stylesheets  
ii) Creative stylesheets  
iii) Cascading stylesheets  
v) None of above  
g) Which of following is not scripting language?  
i) HTML  
ii) XML  
iii) Postscript  
v) Javascript  
h) We use tag within:  
i) <head> only  
ii) <title>  
iii) <head> and <1 body>  
v) <javascript>  
i) Javascript is _________ side scripting language.  
i) Server  
ii) Browser  
iii) ISP  
v) None of the above  
j) Which of the following HTML code is valid?  
i) <font colour = “red”>  
ii) <font color = “red”>  
iii) <red><font>  
v) All of the above  

UNIT-I

Q.2  
Write short notes on:  
a) SMTP  
b) Usenet  
c) URL  

Q.3  
Write short notes on:  
a) What is internet? What are its application areas?  
b) Write a short note on internet security.  

UNIT-II
Q.4   a) Explain the structure of HTML.  
    b) Differentiate external and internal linking.  
    c) Explain image tag and its attributes.  

Q.5   Create an admission form in HTML using buttons, textbox, radio button, checkbox and listbox with all attributes. 

    **UNIT-III**

Q.6   a) What are frames? Insert the four web pages in the frames using appropriate examples.  
    b) Differentiate between <Address> and <Blockquote> tags.  

Q.7   a) Explain various character formatting tags in HTML.  
    b) Differentiate between colspan, rowspan, cellspacing and cellpadding in table.  

    **UNIT-IV**

Q.8   What are cascading stylesheets? Explain the types of stylesheets in detail.  

Q.9   a) Write a program in javascript for swapping of two images.  
    b) Differentiate between prompt(), alert() and confirm() boxes.
Q.1 Fill in the blank with appropriate word:
   a) An operating system is a __________ software.
   b) System calls are __________ instructions.
   c) Long term scheduler is also called as ________.
   d) The measure used to control thrashing is __________.
   e) A __________ is a collection of related information that is stored on secondary storage.

State whether True or False:
   f) A file has a certain defined structure according to its type.
   g) External fragmentation is the cause of allocating more space than required by the process.
   h) The running processes in execution state may be suspended because of I/O or because of preemption.
   i) Banker's algorithm is used to detect deadlock.
   j) MS-DOS supports multiprogramming.

**UNIT-I**

Q.2 a) Discuss advantages of multiprogramming systems.
   b) List the differences between timesharing and multiprogramming systems.
   c) What is spooling?

Q.3 a) What is a Kernal? Explain its main functions.
   b) What is the purpose of command interpreter? Why is it usually separated from the Kernal?

**UNIT-II**

Q.4 Compare and contrast FCFS and SJF scheduling algorithms with the help of suitable examples.

Q.5 a) Define a process with examples.
   b) Differentiate between long term, short term and medium schedulers with their appropriate examples.

**UNIT-III**

Q.6 Discuss the technique of paging in detail.

Q.7 Discuss:
   a) Swapping
   b) Virtual memory.

**UNIT-IV**

Q.8 a) Explain different types of file formats. Also give examples.
b) Explain various methods for free space management. Illustrate it with an example.

Q.9 Discuss FCFS, SCAN and CSCAN disk scheduling algorithm by taking a suitable example.
Q.1 Answer the following questions:
   a) What does B2C stands for?
   b) Give at least three examples of websites which provide facility for cyber cash.
   c) Name two groups in which products of e-money can be categorized.
   d) What does EFT stands for?
   e) What is the stored value of a smart card?
   f) Name three categories of the intellectual property over the internet.
   g) What is an ISP?

Fill in the blanks:
   h) ‘e-business’ is any business that is empowered by an ________.
   i) The e-check system is an ________ of the paper-check system.
   j) ________ is the number that identifies a machine on the internet.

UNIT-I

Q.2 What is an ‘e-Commerce’? What are the advantages and disadvantages of engaging in e-Commerce activity to identify new applications in business? 15

Q.3 Write short notes on the following:
   a) Implications of IT on e-business strategy. 8
   b) Porter’s value chain model. 7

UNIT-II

Q.4 What is business-to-business e-commerce? Also discuss three models of B2B e-commerce. 15

Q.5 Explain the following:
   a) EDI. 8
   b) Just-in-time delivery. 7

UNIT-III

Q.6 What are the main differences between a credit card and a debit card? Why is one type of card favored over the other? 15

Q.7 Explain the following:
   a) e-money 7
   b) Legal, ethical and other public policy issues. 8

UNIT-IV

Q.8 Identify the key steps to setup an infrastructure for the e-commerce. Which step is most critical and Why? 15

Q.9 Explain the following:
a) Virtual communities. 7
b) The future of e-commerce. 8
End Semester Examination, May 2015  
BCA - Third Semester  
BUSINESS ORGANIZATION AND PRINCIPLES OF MANAGEMENT (BCA-304)  

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 Fill in the blanks:  
a) One of the external environment factor that influence management is ___________.  
b) There are __________ types of degree of delegations.  
c) LPG stands for liberalization, __________ and globalization.  
d) All levels of management between the supervisory level and the top level of the organization are termed ___________.  
e) __________ is the ability to translate knowledge into action that results in desired performance.  

Choose the correct option:  
f) Management is the combination of:  
   i) Art  
   ii) Science  
   iii) Profession  
   iv) Above three  
g) Which of the following is false about the characteristic of modern organizations?  
   i) Have little global focus.  
   ii) Face simultaneous pressure for stability and change.  
   iii) Some employees will find such organizations stressful.  
   iv) Use the internal to manage external interactions.  
h) Decision making is a primary part of the managerial process (True/False)  
i) Define an informal organization.  
j) Name the physical aspect of an enterprise.  

UNIT-I  

Q.2 What do you mean by a business? How is it different from a profession? Explain with an example.  

Q.3 What factors affect the business system? Explain their role in context of the objectives and social responsibilities of a business.  

UNIT-II  

Q.4 Write short notes on the following (any three):  
a) Organization as a system.  
b) Stress as a motivator.  
c) Decentralization.  
d) Objectives of organizational behavior.  

Q.5 Explain the behavioural models of decision making in an organization.  

UNIT-III
Q.6  What is the concept of universality of a management? Give arguments for and against this concept.  

Q.7  “Management process is considered to consist of certain functions”. Explain various functions in a logical order.  

UNIT-IV

Q.8  Why human resource management is essential for an organization? How is it different from human resource development?  

Q.9  What are the sources available to a business firm for recruiting its employees? Describe the merits and demerits of various sources.
End Semester Examination, May 2015
BCA - Third Semester
DATABASE SYSTEMS (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 disadvantages of traditional file system is:
      i) Data redundancy
      ii) Data inconsistency
      iii) Poor data control
      iv) All of the above
   b) The responsibilities of DBA are:
      i) Deciding users
      ii) Backup
      iii) Both i) and ii)
      iv) None of the above
   c) An attribute which does not identify data uniquely is called:
      i) Secondary key
      ii) Primary key
      iii) Foreign key
   d) Which is a free formatted language?
      i) SQL
      ii) Relational algebra
      iii) Relational calculus
   e) A transaction must be in following states:
      i) Active state
      ii) Partially committed
      iii) Failed
      iv) All of the above

State whether TRUE or FALSE:
   f) A distributed database system is a collection of sites connected through network.
   g) Third normal form is also known as PJNF.
   h) SQL offers command interface to write queries.
   i) The SQL DML provides commands for defining the relations, deleting the relations and modifying the existing relation schemes.
   j) The relational model was discovered by Dr. E.F. Codd.

UNIT-I

Q.2 What is data model? Explain the data structure of relational data model. Also, differentiate between Network and an Hierarchical data model.

UNIT-II

Q.4 Explain the term ‘relational algebra’ and various operations performed in it. Give example of each.

UNIT-III

Q.5 Give the format and purpose of following with examples:
   a) Alter table
   b) Group by clause
   c) Length
   d) Distinct
   e) Having clause
Q.6 Define normalization? Explain and define 1NF, 2NF, 3NF by giving suitable examples for each.

Q.7 Explain:  
a) Functional dependency  
b) BCNF  
c) 4 NF

UNIT-IV

Q.8 What do you mean by security of database? Explain various ways of database security and recovery procedures in brief.

Q.9 What is meant by query processing? Discuss various general strategies for query processing? Also, discuss query optimization through a suitable example.
Q.1  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 a code.
   iv) To extend the capabilities of a class.

   b) Which of the following is not an ODP feature in C++?
      i) Inheritance
      ii) Polymorphism
      iii) Objects
      iv) Exceptions

   c) A class can have many methods with the same name, as long as the number of parameters are different. This is known as:
      i) Method overloading
      ii) Method invocating
      iii) Method overriding
      iv) Method labeling

   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) The do while loop is ideal for loop structures that:
      i) Repeat some process a fixed number of times.
      ii) Must execute some process atleast one time.
      iii) Must check the loop condition before the loop body is executed.
      iv) Do all of the above.

   f) What will happen when defining the enumerated type?
      i) It will not allocate memory.
      ii) It will allocate memory.
      iii) It will not allocate memory to its variables.
      iv) None of the above.

   g) 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.

   h) Which of the following operations could not he overloaded?
      i) i) Size of ii) + iii) += iv) ::
      i) Which is used to create a pure virtual function?
         i) $ ii) =0 iii) & iv) !
      i) Which keyboard is used to handle an exception?
         i) Try ii) Throw iii) Catch iv) None of the above

   1½x10

UNIT-I

Q.2  Explain the basic concepts of object oriented programming. 15

Q.3  Describe how data is shared by function in a procedure oriented programs. 15
UNIT-II

Q.4 Describe data types in C++ with details. 15

Q.5 Explain the function classification with the passing of arguments. 15

UNIT-III

Q.6 What is a constructor? Explain types of constructor with examples. 15

Q.7 Give a programming example that overloads == operator with its use. 15

UNIT-IV

Q.8 What is a virtual function? Write rules for a virtual function. Explain with an example. 15

Q.9 Explain in detail about exception handling in C++. 15
End Semester Examination, May 2015
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) Construct a $3 \times 3$ matrix whose elements are $a_{ij} = i + j$
b) Define upper triangular matrix with an example.
c) Expand $(x + y)^7$ by binomial expansion.
d) Define Lagrange’s mean value theorem.
e) What are countable set? Explain with the help of an example.
f) Define set bounded above.
g) Find $1 + x_P$
h) What is neighborhood of a point?

State whether TRUE or FALSE:
i) A set of all positive real numbers is not bounded above.
j) A finite set has no limit point.

UNIT-I

Q.2 a) Define the following terms with an example:
   i) Transpose of matrix
   ii) Symmetric matrix
   iii) Skew symmetric matrix
b) For the 2 matrices $A$ and $B$ verify that $(AB)^T = B^T \cdot A^T$ where

   $A = \begin{bmatrix} 0 & -1 & 2 \\ 3 & 0 & -1 \end{bmatrix}$ and $B = \begin{bmatrix} 1 & -1 \\ 0 & 2 \\ 5 & 0 \end{bmatrix}$

Q.3 a) How many different words can be formed with the letters of the word BHARAT?
   i) In how many of these B and H are never together.
   ii) How many of these begin with B and end with T.
b) For the matrix $A = \begin{bmatrix} 3 & 1 \\ 7 & 5 \end{bmatrix}$, find $x$ and $y$ so that $A^2 + xI = yA$. Hence find $A^{-1}$.

UNIT-II

Q.4 a) Show that union of two countable sets is countable.
b) Show that union of an arbitrary family of open sets is an open set.

Q.5 a) Show that union of a denumerable collection of denumerable sets is denumerable.
b) Find the supremum and infimum, if exist of the following:
   i) $\{x : -5 < x < 3\}$
   ii) $\{x : x = 4^n, n \in -N\}$
   iii) $\{1, \frac{1}{2}, \frac{1}{3}, \frac{1}{4}, \ldots \}$
   iv) Open interval $(0, 1)$
Q.6  a) Show that a sequence converges if and only if it is a Cauchy’s sequences  

 b) Show that the series $\frac{1}{3} + \frac{1}{3^2} + \frac{1}{3^3} .......$ converges. 

Q.7  State and prove Cauchy’s Root Test.  

UNIT-IV  

Q.8  a) Evaluate $\lim_{x \to \infty} x \tan \frac{1}{x}$  

 b) Show that $\frac{x}{x+1} < \log(1+x) < x; \hspace{1em} x > 0$  

Q.9  a) Expand $e^{2x}$ by Maclaurin’s theorem.  

 b) Evaluate $\lim_{x \to a} \frac{\log(x-a)}{\log(e^x-e^a)}$ by L’Hospital’s Rule.
End Semester Examination, May 2015  
BCA -Third Semester  
MATHEMATICS-II (BCA-301) 

Max Marks: 75  
No. of pages: 2  

Time: 3 hrs  

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) If order of A is MXP and order B is PXN then order of AB is ______.  
b) If \[
\begin{bmatrix}
5 & 3 & 2 \\
0 & 4 & 1 \\
0 & 0 & 3 
\end{bmatrix}
\] find |A|. 
c) In how many ways can the letters of the word PRAISE be arranged?  
d) Formula of general term in binomial expansion is ______.  
e) Define monotonic increasing function with an example. 
f) Define supremum and infimum of set with an example. 
g) Find the convergence of sequence \[<u_n> = \frac{8n-3}{2n+1}\]. 
h) What is the limit of a sequence \[\{s_n\} = \left\{\frac{1}{n}; n \in \mathbb{Z}^+\right\}\]. 
i) Define the criteria for consistency of a system of linear equations.  
j) Inverse of every square matrix, if it exists is unique (True/False).  

UNIT-I  

Q.2  
a) Verify that \[A(B+C) = AB + BC\] where \[A = \begin{bmatrix} 1 & 2 \\ 0 & 4 \end{bmatrix}\]; \[B = \begin{bmatrix} 1 & 2 & 3 \\ 0 & 4 & 5 \end{bmatrix}\] and \[C = \begin{bmatrix} 1 & 0 & 1 \\ 2 & 3 & 0 \end{bmatrix}\]. 
b) Evaluate: \[6C_1 + 6C_2 + 6C_3 + 6C_4 + 6C_5 + 6C_6\]. 

Q.3  
a) Find the coefficient of \[x^4\] in \[(x^4 + \frac{1}{x^6})^{15}\]. 
b) Out of 7 consonants and 4 vowels, how many words of 3 consonants and 2 vowels can be formed?  

UNIT-II  

Q.4  
a) Prove that all real numbers in the interval \([0 1]\) is uncountable. 
b) Find the least upper bound and greatest lower bound of the followings:  
   i) \[\{x : -5 < x < 2\}\]  
   ii) \[\left\{\frac{1}{5n}; n \in \mathbb{Z}, n \neq 0\right\}\]  
   iii) \[\{x; x = 1 + \frac{1}{n}, n \in \mathbb{N}\}\]  
   iv) \[\{x = 1 - \frac{1}{n}; x \in \mathbb{N}\}\]  

Q.5  
a) Prove that the union of 2 countable sets is countable. 
b) Prove that union of an arbitrary family of open sets is an open set.  

UNIT-III  

Q.6  
a) State and prove Cauchy’s general principle of convergence.
b) Prove that a monotonically increasing sequence \( <U_n> \) bounded above converges to its least upper bound.

Q.7 a) Discuss the convergence of the sequence \( <u_n> \) where \( u_n = \frac{2n - 7}{3n + 2} \).

b) State and prove comparison test of 5th form of series of numbers.

UNIT-IV

Q.8 a) Show that \( \frac{x}{x + 1} < \log(1 + x) < x : x > 0 \).

b) Expand \( a^x \) and \( e^x \) in power of \( x \) by Maclaurin’s theorem.

Q.9 a) Evaluate \( \lim_{x \to 0} \frac{1 + \sin x - \cos x + \log(1 - x)}{x \tan^2 x} \).

b) Evaluate \( \lim_{x \to a^+} \frac{\log(x - a)}{\log(e^x - e^a)} \) by L’Hospital rule.
End Semester Examination, May 2015
BCA -Second Semester
WORKSHOP IN EVS (BCA-206)

Time: 3 hrs
Max Marks: 50
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:
   a) If waste materials contaminate the source of drinking water which of the following diseases will spread:
      i) Scurvy           ii) Typhoid         iii) Malaria       iv) Anaemia
   b) Which of the following wastes cannot be decomposed by bacteria to form compost?
      i) Kitchen waste    ii) Plastic and polythene bags
      iii) Dead plants    iv) Bodies of insects living in the soil
   c) When trees are cut, amount of oxygen?
      i) Decreases       ii) Increases
      iii) Both a and b  iv) Remains same
   d) 71% of earth surface is covered with:
      i) Land            ii) Air
      iii) Water         iv) Coal
   e) Acid rain is due to:
      i) Combustion of fossil fuels    ii) Oil slick
      iii) Oxides of sulphur           iv) Nuclear wars
   f) The gas associated with global warming is:
      i) CO$_2$           ii) H$_2$S
      iii) CH$_4$         iv) SO$_2$
   g) Which of these is biodegradable?
      i) Cow dung        ii) Pepsi can
      iii) Plastic rubber iv) CDs
   h) Female sterilization inhibits ________ production.
      i) Egg             ii) Estrogen
      iii) Progesterone  iv) All of the above
   i) Bhopal gas tragedy occurred due to:
      i) Methane        ii) Phosgene
      iii) Methyl isocyanate  iv) Methyl amine
   j) Who started the Chipko movement?
      i) Kiran Bedi     ii) S.L. Bahuguna
      iii) Medha Patkar iv) None of the above

UNIT-I

Q.2 a) Why do people need to be aware about environmental issues?  
     b) Differentiate between renewable and non-renewable sources of energy.

Q.3 a) Explain why environmental studies is made as mandatory or essential subject in the syllabus.
     b) How can we help and save environment? Explain in detail.

UNIT-II
Q.4  
a) Illustrate how energy flows in an ecosystem with an example.  
b) What is a food chain? How does a food chain get affected when one of the trophic levels is disturbed?  

Q.5  
a) Differentiate between producers, consumers and decomposers.  
b) What is an ecological pyramid? Mention at least two types.  

**UNIT-III**  

Q.6  
a) What do you mean by pollution? Name its different types and the two major causes for each type of pollution.  
b) Mention the major reasons for global warming and climate change.  

Q.7  
Write short notes on any two:  
a) Unsustainable and sustainable development.  
b) Wasteland reclamation.  
c) Environmental Protection Act.  

**UNIT-IV**  

Q.8  
a) Illustrate the role of information technology in environment and human health.  
b) What are the major causes of AIDS? Mention various symptoms and effects of AIDS.  

Q.9  
a) How can we control population explosion? Why do we need to control it?  
b) Explain how increase in human population is causing increase in environment pollution.
Q.1 
**Fill in the blanks:**

a) _______ flip-flop is used to store data in registers.
b) The decode instruction is stored in _______.
c) The output of a gate is low when atleast one of its input is low. It is true for _______ gate.
d) Micro instructions are stored in _______ memory.
e) The DMA controller has _______ registers.

**Multiple Choice questions:**

f) A flip-flop has:
   i) One stable state
   ii) No stable state
   iii) Two stable state
   iv) None of the above

g) Which of the following expression is in SOP form?
   i) \((A + B)(C + D)\)
   ii) \((A\overline{B})(\overline{C} + D)\)
   iii) \(AB(CD)\)
   iv) \(AB + CD\)

h) Applying DeMorgan’s theorem to the expression \((\overline{x + y}) + \overline{z}\), we get:
   i) \((x + y)z\)
   ii) \((\overline{x + y})z\)
   iii) \((x + y)\overline{z}\)
   iv) \((\overline{x + y})\overline{z}\)

i) Which of the following expresses the commutative law of multiplication?
   i) \(A + B = B + A\)
   ii) \(AB = B + A\)
   iii) \(AB = BA\)
   iv) \(AB = A \times B\)

j) What are the symbols used to represent digits in binary number system?
   i) 0, 1
   ii) 0, 1, 2
   iii) 0 through 8
   iv) 1, 2

**UNIT-I**

Q.2  
a) What is the requirement of a number system? Explain in detail.  
b) Convert: \((12.456)_{8} = (\_\_\_)_{2}, (\_\_\_)_{10}, (\_\_\_)_{16}\)  

Q.3  
a) Find the addition of following unsigned binary number:
   i) \(1110 + 111\)
   ii) \(11011 + 11011\)

b) Perform AND, OR & XOR with two binary strings \(1011100\) and \(10100001\).

c) Explain the concept of Hamming code with the help of an example.

**UNIT-II**

Q.4  
Explain all the gates with their truth tables.

Q.5  
Simplify the followings using K-map:
a) \(F(A, B, C, D) = \sum 1, 5, 6, 8, 9, 12\)
b) \(F(X, Y, Z) = \sum 1, 2, 5, 7\)
UNIT-III

Q.6  a) What do you mean by an instruction cycle? Explain its different phases in detail.   
     b) Explain different types of instructions in detail.

Q.7  Write short notes on:
     a) RISC          ii) CISC          iii) Subroutine calls

UNIT-IV

Q.8  Differentiate between:
     a) I/O and memory bus
     b) Asynchronous and Synchronous date transfer.
     c) Isolated and memory mapped I/O.

Q.9  Explain the working of a DMA controller and transfer with the help of block diagram.
Q.1 a) One of the major strength of Visual Basic language is ________.
b) ________ and ________ are procedur al languages.
c) Integer data type takes ________ bytes.
d) Static variables are ________ only once.
e) ________ is an example of string function.
f) ________ is a conditional statement.
g) The reference library of Visual Basic is called ________.
h) Menus are created using ________ in Visual Basic.
i) ________ function converts string to numerical value.
j) In ________ only one option can be selected at a time.

UNIT-I

Q.2 Explain the use of following terms:
a) Menu Bar b) Tool Bar c) Tool Box

Q.3 Explain all the components of Visual Basic IDE (Integrated Development Environment) in detail.

UNIT-II

Q.4 Explain the following data types in Visual Basic:
a) String b) Integer c) Variant

Q.5 a) Explain the two conditional statements available in Visual Basic with the help of examples.
b) Explain the difference between local and static variables using an example.

UNIT-III

Q.6 Explain the following controls in Visual Basic:
a) Text Box b) List Box c) Frame

Q.7 Differentiate between the followings:
a) List Box and Combo box b) Check Box and Option Button c) Label and Text Box

UNIT-IV

Q.8 Explain all the steps required to create a menu using menu editor in Visual Basic.

Q.9 Explain the following terms:
a) Data Control b) Data Grid Control c) Data Report.
Q.1  

a) Define cardinality of a set with an example. 

b) If \( P = \{a, b, c\} \) and \( Q = \{k, l, m, n\}\), determine \( P \times Q \). 

c) If \( A = \{\phi, a\} \), construct \( A \cup P\{A\} \). 

d) Explain the working rule of mathematical induction. 

e) If a set \( A \) has \( n \) elements, how many relations are there from \( A \) to \( A \). 

f) If \( X = \{3, 2, 1\} \) and \( Y = \{9, 8\} \) and \( R = \{(1.8), (2.8), (1.9)\}(3.9)\), find \( R \). 

g) The sum of degree of all the vertices in a graph \( G \) is even. (True / False) 

h) Define path and circuit in graph. 

i) Define complete binary tree with an example. 

j) Consider the set \( A = \{4, 5, 6, 7\} \). Let \( R \) be the relation \( \subseteq \) of \( A \). Draw the Hasse diagram of \( R \). 

UNIT-I 

Q.2  

a) Let \( X = \{a, b, c\}\). Define \( f : X \rightarrow X \) such that \( f = \{(a, b), (b, a), (c, c)\} \). Find: 

i) \( f^{-1} \) 

ii) \( f^2 \) 

iii) \( f^3 \) 

b) Prove that \( 1 + 2 + 3 + 4 + \ldots + n(n+1) = \frac{n(n+1)(n+2)}{3} \) by mathematical induction. 

UNIT-II 

Q.3  

a) Describe equivalence relation briefly. 

b) Let \( R \) be a binary relation on the set of all integer \( I \) such that: 

\( R = \{(a, b) \mid (a - b) \text{ is even integer}\} \). Is \( R \) reflexive? Symmetric? Transitive? Equivalence relation? 

c) Prove that by mathematical induction \( n(n+1)(2n+1) \) is divisible by \( 6 \). 

Q.4  

a) Consider the set \( D_{50} = \{1, 2, 5, 10, 25, 50\} \) and relation divides \( (\mid) \) be a partial ordering relation on \( D_{50} \). 

i) Draw Hasse diagram of \( D_{50} \) with relation divides. 

ii) Determine all upper bounds of 5 and 10. 

iii) Determine all lower bounds of 5 and 10. 

iv) Determine g.l.b of 5 and 10 

v) Determine l.u.b of 5 and 10 

b) Define sublattice. Consider the lattice of all positive integer \( I \), under the operation of divisibility. The lattice \( D_n \) of all divisor of \( n > 1 \) is a sublattice of \( I_+ \). Determine all the sublattice of \( D_{30} \) that contain at least four elements.
Q.5  a) Given the Boolean expression: \( f = ABC + B\bar{C}D + \bar{D}BC \)
   i) Make the truth table.  
   ii) Simplify using K-map
b) Consider the Boolean algebra \( D_{30} \), determine the followings:
   i) All the Boolean subalgebra of \( D_{30} \)
   ii) All Boolean algebras which are not Boolean subalgebra of \( D_{30} \) having atleast four elements.

UNIT-III

Q.6  a) Find the equation of a line passing through the point \((2,3)\) and making an angle of \(45^0\) with the line \(3x + y - 5\).
   b) Solve the differential equation \( a_r - 7a_{r-1} + 10a_{r-2} = 0 \), satisfying the conditions \(a_0 = 0\) and \(a_1 = 6\).

Q.7  a) Two points \( A(0,0) \) and \( B(3,\sqrt{3}) \) form an equilateral triangle with another point \( P(x,y) \). Find the coordinate of \( P \).
   b) Solve the differential equation: \( 2a_r - 5a_{r-1} + 2a_{r-2} = 0 \) and find particular solution such that \(a_0 = 0\) and \(a_1 = 1\).

UNIT-IV

Q.8  a) Find the minimum spanning tree of the labeled connected graph.

b) Consider the binary tree as shown below. Draw the binary tree for each of the following operations if applied to the binary tree. Also draw the undirected graphs \( K_3 \) and \( K_5 \).
   i) Delete the node V  
   ii) Delete the node E  
   iii) Delete the root node R
Q.9 Find the shortest path between a to z in the graph.
End Semester Examination, May 2015
BCA -Second Semester
DATA STRUCTURES (BCA-201)

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 Fill in the blanks:
  a) A stack is an ordered list in which all insertion and deletion are made at one end, called ________.
  b) Queue is a ________ list.
  c) The complexity of linear search algorithm is ________.
  d) The operation of processing each element in an array is ________.
  e) The complexity of bubble sort is ________.

Multiple choice questions:
  f) When new data are to be insisted into a data structure, but there is no available space, this situation is called:
     i) Underflow
     ii) Overflow
     iii) Houseful
     iv) Saturated
  g) The largest element of an array index is called its:
     i) Lower bound
     ii) Upper bound
     iii) Range
     iv) None of the above.
  h) The depth of complete binary tree is given by:
     i) $n \log_2 n$
     ii) $n \log_2 n + 1$
     iii) $\log_2 n$
     iv) $\log_2 n + 1$
  i) The size of a problem is measured in terms of:
     i) Output
     ii) Input
     iii) Level of problem
     iv) Complexity
  j) Which of the following sorting procedure is the slowest?
     i) Quick sort
     ii) Heap sort
     iii) Shell sort
     iv) Bubble sort

UNIT-I

Q.2 a) What do you mean by an algorithm? How can we measure the efficiency of an algorithm? 8
b) Write algorithm to find largest and second largest element from a list. 7

Q.3 a) What do you mean by a circular queue? What are the advantages of circular queue over linear queue? Justify your answer. 8
b) Convert the following infix notation into postfix notation:
   $A \ast (B + C \ast D) + E$
   Also write an algorithm for the same. 7

UNIT-II

Q.4 a) Write recursive algorithm for a binary search. Why binary search is better than linear search? Justify your answer. 10
b) Write a short note on doubly linked list. 5

Q.5 a) Write an algorithm for inorder traversal. 5
b) Write a short note on binary tree. 5
c) How can we represent a polynomial using a linked list? 5
UNIT-III

Q.6 Write algorithm for merge sort.  

Q.7 What are the various ways to represent a graph? Explain with the help of an example.  

UNIT-IV

Q.8 a) What are the various file operations?  
b) What are the various collision resolution methods? Explain with example.  

Q.9 a) What do you mean by Index Sequential Access Method (ISAM)?  
b) Differentiate between fixed and variable length record.  
c) Hash function
End Semester Examination, May 2015  
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 collection of readymade pictures is called ________.  
b) We can change the styles of a shape using ________ tab.  
c) The file extension of EXCEL workbook is ________.  
d) Print review is used for __________.  
e) Ctrl+s key is used for __________.  
f) DOS means DISK OPERATING SYSTEM. (True/False)  
g) All the files in a folder should have same name. (True/False)  
h) WORD can check grammar while checking grammar. (True/False)  
i) Define macro.  
j) Define screen saver.  

UNIT-I

Q.2  
a) Explain file management through Windows.  
b) Explain Five external commands in DOS.  

Q.3  
a) Write short not on Windows Accessories.  
b) Define operating system. Discuss the types of operating system.

UNIT-II

Q.4  
a) Create a list of 10 best friends. Create a thank you letter. Use mail merge feature of MS word to create thank you letter for each of your friend from above two files.  
b) How text is formatted in MSWORD?

Q.5  
Define the following terms:  
i) LINKS  
ii) Headnotes  
iii) Header and footer  
iv) WIZARDS  
v) Tables

UNIT-III

Q.6  
a) Explain any five mathematical functions in MS-EXCEL.  
b) Discuss the concept of Freeze Panes in MS-EXCEL.

Q.7  
a) Explain the following:  
i) Creating a workbook  
ii) Opening a workbook  
iii) Saving a workbook  
iv) Creating and inserting a worksheet  
v) Deleting a worksheet  
b) Discuss any two date and time functions.

UNIT-IV

Q.8  
a) How MS-PowerPoint is a better option for a business presentation? Discuss.  
b) Discuss the various types of views in MS-PowerPoint.

Q.9  
a) Write the steps for the following:
i) Checking spelling and correcting with objects.
ii) Adding clipart and other pictures.
iii) Printing presentation.

b) Write the benefits of PowerPoint presentation.
Q.1 Choose / fill the correct option:

a) Communication starts with
   i) Message    ii) Sender    iii) Channel    iv) Feedback

b) The two broad areas of communications are:
   i) Oral and written communication.
   ii) Verbal and written communication.
   iii) Verbal and non-verbal communication.
   iv) Oral and non-verbal communication.

c) Which of the following are examples of written communication?
   i) Letters and Voicemail
   ii) Reports and email
   iii) Circulars and voicemail
   iv) Presentations and email.

d) All the following are external stakeholders of an organization, except:
   i) Media
   ii) Government
   iii) Suppliers
   iv) Shareholders

e) Readability is determined mainly by:
   i) Punctuation
   ii) Length of words
   iii) Active and passive voice
   iv) Spelling

f) Writing style can be improved through use of:
   i) Jargon
   ii) Slang
   iii) Simple words
   iv) Metaphors

g) One advantage of telephone communication is:
   i) Good for problem solving
   ii) Permits use of some non-verbal cues
   iii) Conveying large amount of information
   iv) Keeping a permanent record

h) All of the following types of information can be posted on the intranet except:
   i) Employee benefits
   ii) Declared holidays
   iii) Company policies
   iv) Performance appraisals

i) Which of the following is not a compulsory part of a business letter?
   i) Salutation
   ii) Close
   iii) Attention line
   iv) Body

j) A resume summarizes the following:
   i) Strengths and weaknesses
   ii) Personality
   iii) Education and experience
   iv) Hobbies

Q.2 Choose correct option:

a) She looks ________ than she is.
   i) much younger    ii) very younger    iii) more young    iv) more younger

b) We were caught ________ a shower on our way home:
   i) in    ii) with    iii) at    iv) by

c) Policy, is, the, Honesty, best. (Rearrange to form a meaningful sentence)

d) Godliness, to, cleanliness, is (Rearrange to form a meaningful sentence)

e) It may ________ in the afternoon. (raining/rained/rain)

f) Boy:Girl::man: ________

UNIT-I
g) “________do you live?” ________ in India. (Fill up)

h) “________ do you come to school?” ________ by bus. (Fill up)
i) The antonym of spendthrift is ________.
j) The synonym of honest is ________.
k) Full form of ISDN is ________.
l) Full form of ERP is ________.
m) He ________ from London. (be/ is/ am/ are)
n) What is ________ dog called? (him/ her/ them/ you)
o) ________ English? (Do you be/ You are/ Are you/ Is you) 1x15

Q.3  
a) Fill in each of the blanks with the correct form of present tense:
i) Janet ________ Karate class every Saturday. (attend)
ii) The market ________ usually noisy in the morning. (to be)
iii) Aanya ________ her room for the past hour. (Paint)
iv) The delivery man ________ the parcel already. (delivery)
v) You are late. The bus ________ already. (leave) 1x5

b) Convert to questions:
i) They are working hard.
ii) They will be working hard.
iii) They had worked hard.
iv) They have been working hard. 1x4

c) Rearrange the words and phrases to form meaningful sentence:
i) Last / the / week / President / Obama / of / the / USA / India / visited.
ii) He / the / went / Humayun’s / to / tomb / see / with / his.
iii) He / time / spent / with / some / the / street / in / children / an / NGO. 2x3

UNIT-II

Q.4  
a) Write your first experience when you visited the collage for the 1st time and the conversation in the form of dialogues you had in Admission Cell. 8
b) You have to organize a business trip to Goa. Mention the conversation between the different managers for the same in the form of dialogue. 7

Q.5  
a) Mention basic etiquettes that need to be followed while conversing either at college or outside college. 8
b) “People who know how to talk can easily win over hearts”. Explain 7

UNIT-III

Q.6  
How do you define personality? What are its determinants and types? 15

Q.7  
a) “Goal set is goal half achieved”. Do you agree with this? Justify your opinion. 8
b) Who is a facilitator? What are the key roles performed by him? 7

UNIT-IV

Q.8  
a) Why do we have to design resumes with caution? What are the basic points under consideration while designing resumes? 8
b) Design your resume with the cover letter for the post of Software Engineer in ABC Company Ltd. 7
Q.9  

a) Why does an organization conduct interviews? What are the different types of interviews?

b) Explain the role of communication technology in the workplace.
Q.1 a) In a throw of dice, what is the probability of getting number greater than 5?
   b) If a set \( A \) has \( n \) elements, then the total number power set of \( A \) is \( ________ \).
   c) Find the 7th term of sequence \( 2, 4, 6, 8 \ldots \) \( ________ \).
   d) What is the value of \( \sin \frac{3\pi}{2} + \cos \frac{2\pi}{3} \).
   e) If \( \sin(x + 20) = \cos x \), find the value of \( x \).
   f) The value of \( \log_3(1/125) \) is \( ________ \).
   g) If \( \log_{32} x = 0.8 \), then \( x \) is equal to \( ________ \).
   h) If we differentiate: \( y = \frac{x^4}{4} + 2x^2 \), we get \( ________ \).
   i) Evaluate: \( \int (5x^2 - 4x + 6)dx \)
   j) The general term of G.P. is \( ________ \).  

UNIT-I

Q.2 a) In a group of 65 people, 40 like cricket, 10 like both cricket and tennis. Find:
   i) How many like tennis
   ii) How many like tennis only and not cricket.  
   b) Sum the series \( 0.3 + 0.33 + 0.333 + \ldots \) to \( n \) terms.  

Q.3 a) The 5th term of a G.P is \( \frac{1}{3} \) and 9th term is \( \frac{16}{243} \). Find the 4th term. 
   b) Find the domain and range of the following functions:
   i) \( y = \frac{x^2 - 1}{x - 1}, x \neq 1 \)  
   ii) \( y = \sqrt{x} \)  

UNIT-II

Q.4 a) Prove that \( \sin^4 \theta - \cos^4 \theta = \sin^2 \theta - \cos^2 \theta \)  
   b) Solve for \( x \log(4x - 3) = \log(x + 1) + \log 3 \)  

Q.5 a) Prove that \( 7 \log\frac{16}{15} + 5 \log\frac{25}{24} + 3 \log\frac{81}{80} = \log 2 \)  
   b) In a bag, there are 100 bulbs out of which 30 are bad ones. A bulb is taken out of bag at random. Find the probability of the selected bulb to be good.  

UNIT-III

Q.6 a) Evaluate: \( \lim_{x \to a} \frac{(x + 2)^{\frac{2}{3}} - (a + 2)^{\frac{2}{3}}}{x - a} \)  
   b) If \( y = \sqrt{1 + x^5} \); Prove that \( \frac{dy}{dx} = \frac{5x^4}{2y} \)
Q.7  a) For what value of $k$ is the following function continuous at $x = 4$:

$$f(x) = \begin{cases} 
\frac{x^2 - 16}{x - 4} & \text{if } x \neq 4 \\
\quad k & \text{if } x = 4 
\end{cases}$$

b) If $y = (x - \sqrt{1 + x^2})$; Prove that: $(1 + x^2) \left( \frac{dy}{dx} \right)^2 = y^2$

UNIT-IV

Q.8  a) Evaluate $\int \frac{\sin x}{(1 + \cos x)^2} \, dx$  

b) Solve the differential equation $\frac{dy}{dx} = x \log x$

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

b) What is Algebraic structure? Explain Groups and Rings with examples.
Q.1 Multiple choice questions:
   a) A flip flop has:
      i) One stable state    ii) No stable state
      iii) Two stable states iv) None of the above
   b) Which is typically the longest: bit, byte, nibble word?
      i) Bit    ii) Byte    iii) Nibble iv) word
   c) A JK flip flop is in a “no change” condition when:
      i) J=1 K=1    ii) J=1, K=0    iii) J=0, K=1    iv) J=0, K=0
   d) The clock signals are used in sequential logic circuits:
      i) to tell the time of the delay.
      ii) to tell how much time has elapsed since the system was turned on.
      iii) to carry serial digital signals.
      iv) to synchronize events in various parts of a system.
   e) The two parts of a microprocessor instruction are called operation and the:
      i) Operand    ii) Operator
      iii) Observable iv) None of the above
   f) A combinational circuit which is used to change a decimal number into an equivalent BCD number is:
      i) Decoder    ii) Encoder
      iii) Multiplexer iv) Demultiplexer
   g) A 20-bit address bus allows access to a memory of capacity:
      i) 1 MB ii) 2 MB iii) 32 MB iv) 64 MB
   h) When is a cache block written into the main memory?
      i) Valid bit is not set
      ii) Every cycle
      iii) Dirty bit is set
      iv) None of the above
   i) A microprocessor retries instructions from:
      i) Control memory
      ii) Cache memory
      iii) Main memory
      iv) Virtual memory
   j) A 32 bit microprocessor has the word length equal to:
      i) 2 bytes ii) 32 bytes
      iii) 4 bytes iv) 8 bytes

UNIT-I

Q.2 a) Why a binary number system is preferred for computers? Explain with reason.

b) Perform the following:
   i) \((798.5)_{10}=(\ ?)_{16}=(\ ?)_{8}=(\ ?)_{2}\) ii) \(79 - (32)\)
Q.3  a) Generate the Hamming code for data bits 1101.
     b) Write short notes on:
        i) Non weighted code
        ii) Floating point numbers

**UNIT-II**

Q.4  What are universal gates? Simulate NAND and NOR gates to all gates.

Q.5  Simplify the following using K-map.
     a) \( F(A, B, C, D) = \Sigma(0, 3, 5, 6, 9, 11, 13, 14, 15) \)
     \( D(A, B, C, D) = \Sigma(1, 2, 8) \)
     b) \( F(w, x, y, z) = \pi(1, 5, 7, 9, 10, 12, 14) \)

**UNIT-III**

Q.6  What is the limitation of JK flip-flop? How can we overcome from them? Obtain the logic diagram of master slave flip-flop using NAND gates.

Q.7  Explain the followings:
     a) Multiplexers
     b) Full adder
     c) Decoder

**UNIT-IV**

Q.8  What is a cache memory? Explain various types of mapping techniques in detail.

Q.9  What is parallel processing? Explain in detail.
Q.1 **Answer the following by choosing the correct option:**

a) A database schema refers to:
   i) Information at particular level
   ii) Overall design of database
   iii) Query language
   iv) Validation issues

b) Row is synonymous with the term:
   i) Record
   ii) Relation
   iii) Column
   iv) Field

c) Which of the following is a group of one or more attributes that uniquely identifies a row?
   i) Key
   ii) Determinants
   iii) Tuple
   iv) Relation

d) Traditional set operators include:
   i) Union
   ii) Selection
   iii) Projection
   iv) Division

e) Which structure is network model based on?
   i) Graph
   ii) Linked list
   iii) Domain
   iv) None of the above

f) Which of the following is not a type of SQL constraint?
   i) Primary key
   ii) Foreign key
   iii) Alternate key
   iv) Unique key

g) A functional dependency is a relationship between or among:
   i) Tables
   ii) Rows
   iii) Relations
   iv) Attributes

h) Read only databases are _______ updated.
   i) Always
   ii) Commonly
   iii) Increases
   iv) None of the above

i) A transaction completes its execution is said to be:
   i) Committed
   ii) aborted
   iii) Rolled back
   iv) Failed

j) In ER diagram, ER stands for:
   i) Entity-Record
   ii) Entity-Relationship
   iii) Entity-Row
   iv) All of the above.  

**UNIT-I**

Q.2 What is file based approach of database? Explain its limitations. How DBMS management system is better solution along with advantages and disadvantages of DBMS?  

Q.3 What are the different notations used for designing an ER diagram and explain their usage?  

**UNIT-II**

Q.4 Explain all types of keys used in relational model with a suitable database example.  

Q.5 Discuss any 10 Oracle functions with proper syntax and suitable examples.
UNIT-III

Q.6 What is meant by normalization? Why do we normalize the database? Explain different techniques of normalization.  

Q.7 Explain two-phase locking protocol with a suitable example in concurrency control.  

UNIT-IV

Q.8 What is the importance of recovery procedure? What is meant by log-based recovery technique? Discuss different types of log based recovery techniques.  

Q.9 What is meant by DDBMS? Compare DDBMS with DBMS and discuss advantages and disadvantages of DDBMS.  

End Semester Examination, May 2015  
BCA -Second Semester  
DATA STRUCTURES (BCA-2001)

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 Answer the following by choosing the correct option:  
a) The smallest element of an array’s index is called its:  
   i) Lower bound  
   ii) Upper bound  
   iii) Range  
   iv) Extraction  
b) Which of the following sorting algorithm is of divide and conquer type?  
   i) Bubble  
   ii) Quick  
   iii) Insertion  
   iv) All of the above  
c) Which data structure allows deleting data elements from front and inserting at rear?  
   i) Stack  
   ii) Queries  
   iii) Dequeue  
   iv) All of the above  
d) Linklist are not suitable for:  
   i) Insertion sort  
   ii) Binary search  
   iii) Queue  
   iv) None of the above  

Fill in the blanks:  
e) Two dimensional arrays are called __________.  
f) Stack is based on the principle __________.  
g) The front of the queries calculated by __________.  

State whether True or False:  
h) A binary tree can be converted into two tree by replacing each empty subtree by a new external node.  
i) A connected graph T without any cycle is called neighbor.  
j) A graph is a non linear data structure.  

1½x10  

UNIT-I

Q.2 a) Suppose A is 2-dimentional array with 20 rows and 4 columns. Each element of array is stored in 4 memory locations if base address is 200. Calculate:  
   i) A[12, 3] using row major  
   ii) A[14, 2] using column major  

7
b) Define the followings:
   i) Data  ii) Information  iii) Time complexity  iv) Space complexity

Q.3  a) Explain sparse array. How can you store the sparse array in memory? Explain with an example.  
     b) Write an algorithm for inserting a new element into a linear array.

UNIT-II

Q.4  What do you understand by stack? Discuss the various operations of stack. Convert the infix notation into postfix notation \((X-Y)/Z) \ast ((U+V) - W)\).

Q.5  a) Mention and explain various types of queue with examples.  
     b) What are advantages and disadvantages of linked lists? How linked lists can be used for polynomial manipulation?

UNIT-III

Q.6  a) From the given binary tree, answer the followings:

   i) Which is root node?  
   ii) Which are leaf nodes?  
   iii) What is the result of pre-order traversal?  
   iv) What is the result of post-order traversal?  
   v) What is the result of in-order traversal?  

   b) Write a short note on threaded tree.

Q.7  What is minimum spanning tree? Write Kruskal algorithm for minimum spanning tree. Also, find the minimum spanning tree for the following:
UNIT-IV

Q.8  a) Sort the following data using quick sort:
      b) Write an algorithm to search a particular element using binary search method.

Q.9  What is hashing? Discuss various hashing techniques. Also, discuss the concept of collision resolution technique in detail.
Q.1 a) Define Rank of matrix.
   b) If $k + 1$, $3k$, $4k + 2$ be any 3 consecutive terms of an A.P., then value of $k$ is _______.
   c) Solve $\log\sqrt{8}/\log 8$.
   d) Find $\frac{dy}{dt}$ for $y = x^9$.
   e) The 9th term of AP sequence 9, 12, 15, 18…… is ________.
   f) If $(a^3) = (b^x)$, then the value of $x$ is ________.
   g) If $A = \begin{bmatrix} 3 & 2 \\ 1 & 1 \end{bmatrix}$ and $AB = \begin{bmatrix} 1 & 3 & 2 \\ 1 & 1 & 1 \end{bmatrix}$, then:
      i) $B$ is not determined
      ii) $B = \begin{bmatrix} -1 & 1 & 0 \\ 2 & 0 & 1 \end{bmatrix}$
      iii) $B = \begin{bmatrix} -1 & 2 \\ 1 & 0 \\ 0 & 1 \end{bmatrix}$
      iv) $B = \begin{bmatrix} -1 & 1 \\ 2 & 0 \end{bmatrix}$
   h) Find the value of $a$ if the following matrix is singular $\begin{bmatrix} -4 & 2 \\ 6 & a \end{bmatrix}$.
   i) Find cofactor of $A_{23}$ of the matrix $A = \begin{bmatrix} 5 & -2 & 7 \\ 6 & 1 & -9 \\ 4 & -3 & 8 \end{bmatrix}$.
   j) If $A = \begin{bmatrix} 5 & 3 & 2 \\ 0 & 4 & 1 \\ 0 & 0 & 3 \end{bmatrix}$, the $|A|$ is _____.

Q.2 a) If $A = \begin{bmatrix} 0 & 3 \\ -7 & 5 \end{bmatrix}$ and $I = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$, then find $K$ so that $KA^2 = 5A - 2I$.
   b) Find the value of $x$ such that $\begin{bmatrix} 1 & 2 & 0 \\ 2 & 0 & 1 \\ 1 & 0 & 2 \end{bmatrix} = 0$.

Q.3 a) Verify Cayley-Hamilton theorem for matrix $A = \begin{bmatrix} 1 & 3 & 3 \\ 1 & 4 & 3 \\ 1 & 3 & 4 \end{bmatrix}$ and hence find $A^{-1}$.
b) Find the rank of matrix \( A = \begin{bmatrix} 3 & 2 & 7 \\ 4 & -3 & -2 \\ 5 & 9 & 23 \end{bmatrix} \).

UNIT-II

Q.4 a) The sum of 3 numbers in A.P. is 15. If 1, 4 and 19 are added to the numbers, the resulting numbers are in G.P. Find the numbers.
b) How many words can be formed from the letters of the word DAUGHTER?
   i) Taking all letters together  
   ii) Beginning with D and ending with R

Q.5 a) Find the 8th term in \( \left[ \frac{2x}{3} - y^2 \right]^{11} \)
b) Sum the series 5+55+555+\ldots\ldots to n terms.

UNIT-III

Q.6 a) Show that \( 2 \log x + 2 \log x^2 + 2 \log x^3 + \ldots + 2 \log x^n = n(n+1) \log x \)
b) Simplify: \( \tan(90 + \theta) \sin(180 + \theta) \sec(270 + \theta) \cosec(180 - \theta) \cot(360 - \theta) \)

Q.7 a) If ABCD is a cyclic quadrilateral, Prove that \( \cos A + \cos B + \cos C + \cos D = 0 \)
b) If \( \log_{\frac{x+y}{7}} = \frac{1}{2} (\log x + \log y) \); Show that: \( \frac{x}{y} + \frac{y}{x} = 47 \)

UNIT-IV

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

\[
f(x) = \begin{cases} 
\frac{x^2 - 4}{x - 2} &; \quad x \neq 2 \\
 k &; \quad x = 2 
\end{cases}
\]
b) If \( y = \sqrt{x} - \frac{1}{\sqrt{x}} \), Show that \( 2x \frac{dy}{dx} + y = 2\sqrt{x} \)

Q.9 a) If \( y = \frac{x}{x+y} \), show that \( x \frac{dy}{dx} = y(1 - y) \)
b) If \( \lim_{x \to\infty} \frac{x^4 - 1}{x - 1} = \lim_{x \to\infty} \frac{x^3 - k^3}{x^2 - k^2} \) find the value of \( k \)
End Semester Examination, May 2015
BCA -First Semester
ENVIRONMENTAL STUDIES (BCA-1003)

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/fill the correct option:
   a) Which of these is not a natural ecosystem?
      i) Desert  ii) Aquarium  iii) Forest  iv) Mountain
   b) Which of these is a threat to environment?
      i) Growing plants  ii) Growing population  iii) Growing crops  iv) Growing flowers
   c) The interactive zone between land, air and water is called:
      i) Aquarium  ii) Lithosphere  iii) Biosphere  iv) Atmosphere
   d) The word ‘Environment’ is derived from a French word ‘Environ’ which means __________.
   e) The thinnest layer of the earth is:
      i) The core  ii) The mantle  iii) The lithosphere  iv) The crust
   f) What is the composition of oxygen in the atmosphere?
      i) 20%  ii) 21%  iii) 22%  iv) 23%
   g) The group of organisms which convert light into food are called:
      i) Autotrophs  ii) Heterotrophs  iii) Decomposers  iv) Omnivores
   h) BOD stands for:
      i) Biotic oxidation demand  ii) Biological oxidation demand  iii) Biological oxygen demand  iv) Biochemical oxygen demand
   i) 5th June is observed as:
      i) World forest day  ii) World environment day  iii) World Wildlife day  iv) World Population day
   j) The hormone responsible for maintaining the pregnancy is:
      i) LH  ii) FSH  iii) Progesterone  iv) Oestrogen 1½x10

UNIT-I

Q.2 a) Why do we need to study environmental studies? 7
b) Explain the role of an individual in conservation of natural resources. 8

Q.3 a) What do you mean by equitable use of resources for sustainable lifestyle? 7
b) What do you mean by Natural resources? What are the associated problems with natural resources? 8

UNIT-II

Q.4 a) Explain the energy flow in an ecosystem with an example. 8
b) Explain the structure and function of an ecosystem. 7
Q.5  a) Write a note on “India as a mega-diversity nation”.  
     b) Explain conservation of biodiversity.  

UNIT-III

Q.6  Give causes, effects and control measures of any three:
     a) Nuclear hazards  
     b) Air pollution  
     c) Water Pollution  
     d) Soil pollution  

UNIT-IV

Q.7  a) What do you mean by a disaster management? Explain with relation to 
     earthquakes and landslides.  
     b) How solid waste can be managed in urban areas and in industries?  

Q.8  a) Why environment needs to be protected? Explain different Environment Protection 
     Acts.  
     b) Write a note on Urban problems related to energy.  

Q.9  a) Explain how economy of India has got affected by population explosion.  
     b) Explain different methods to prevent pregnancy.
End Semester Examination, May 2015
BCA - First Semester
PROGRAMMING IN ‘C’ (BCA-1002)

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) C language was developed by:
   i) Ken Thompson
   ii) Dennis Ritchie
   iii) Peter Noratron
   iv) None of the above

   b) The two operators && and || are:
   i) Arithmetic
   ii) Logical
   iii) Relational

   c) When we use the case control structure?
   i) To choose one from multiple alternatives.
   ii) To switch from one instruction to another.
   iii) To make execution fast.
   iv) None of the above.

   d) The expression $X = 4 + 2 \% 8$ evaluates:
   i) -6
   ii) 6
   iii) 4
   iv) None of the above

   e) The single character input/output functions are:
   i) scanf and printf
   ii) getchar and putchar
   iii) None of the above

   f) #define should not end with a semicolon. (True / False)

   g) A variable which is visible only in the function, in which it is defined is called local variable. (True / False)

   h) A C variable cannot start with a number. (True / False)

   i) Which escape character can be used to begin a new line in C?

   j) Which of the language is predecessor to C programming language? 1½x10

UNIT-I

Q.2  a) Write a program in C language to find area of a triangle. 5

   b) What are the reasons of popularity of C over other programming languages? 5

   c) Write short note on constant. 5

Q.3  What is operator? Discuss various types of operators available in C language. Give an example of each. 15

UNIT-II

Q.4  Write the format, purpose and example of following:
   a) for loop   b) while loop   c) else-if ladder 15

Q.5  a) Give the syntax of declaring Arrays in C language with examples. 8

   b) Write a program in C to generate the Fibonacci series upto $n$ terms. 7

UNIT-III

Q.6  a) Highlight the differences between Structure and Union. 5

   b) Explain with the help of an example how a structure is declared and initialized? 5

   c) Distinguish between formal and actual parameters with examples. 5
Q.7  a) Explain general syntax of C function with an example. 
    b) What is recursion? While writing any recursive function what things must be taken care of?

UNIT-IV

Q.8  a) Distinguish between:
     i) printf() and fprintf()  
     ii) scanf() and fscanf() 
    b) Discuss: fopen() and fclose() functions.  
    c) What is the purpose of rewind()?  

Q.9  a) Discuss the various modes of opening a data file in C. 
    b) Write a note on storage classes.
Q.1 Multiple choice questions:

a) A computer program that converts assembly language to machine language is:
   i) Compiler
   ii) Interpreter
   iii) Assembler
   iv) Comparator

b) ALU is:
   i) Arithmetic logic unit
   ii) Array logic unit
   iii) Application logic unit
   iv) None of the above

c) The term gigabytes refers to:
   i) 1024 mega bytes
   ii) 1024 kilobytes
   iii) Application logic unit
   iv) None of the above

d) The secondary storage devices can only store data but they cannot perform:
   i) Arithmetic operation
   ii) Logic operation
   iii) Fetch operation
   iv) Either of the above

State whether the following statements are True or False:

e) Debugging means detecting, locating and removing all errors in a computer program.

f) Structured programming do not follow modular approach.

g) WORM stands for write once read many.

h) ROM and RAM are secondary storage units.

i) VOICE system are output devices.

j) Condition stub and action stub form a decision table.

UNIT-I

Q.2 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.

UNIT-II

Q.3 Write down the applications of computers in the following fields:
   a) Banking  b) Medicine  c) Sports  d) Airline  e) Weather

Q.4 What do you understand by semi-conductor memory and magnetic memory? What are the similarities between the two? Also specify the major differences between the two.

Q.5 Perform the following conversions:

a) \((172)_{10} = (?)_2\)

b) \((10110110101)_{2} = (?)_{10}\)

c) \((FCA2)_{16} = (?)_2\)
d) \((7952)_8 = (?)_{10}\)
e) \((4459)_{10} = (?)_8\)

**UNIT-III**

Q.6 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.

Q.7 Write down the algorithm and also draw the flowchart for printing a Fibonacci series.

**UNIT-IV**

Q.8 Explain the approach which uses reverse engineering technique to solve the problem. Mention its relative advantages and disadvantages. Compare it with black box technique.

Q.9 Which technique is popularly known as modular approach of programming? Explain its concept with a suitable example. Also mention its advantages and disadvantages.
End Semester Examination, May 2015
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) Graphics that contain movement are often referred to as __________.
      i) Animation                      ii) Motion
      iii) Premier adobe                iv) Flash
   b) JPEG stands for:
      i) Joint photographic experts grade.
      ii) Joint photo experiment group.
      iii) Joint photographic enlarge group.
      iv) Joint photographic experts group.
   c) What is the primary logical unit for data storage in a CD?
      i) Groove                         ii) Pit
      iii) Sector                       iv) Track
   d) One of the disadvantages of multimedia is:
      i) Cost                           ii) Adaptability
      iii) Relativity                   iv) Usability
   e) Which of the following is not a video file extension?
      i) MP4                            ii) AVI
      ii) QT                             iv) JPG
   f) Video is represented as a series of images formally known as:
      i) Pics                           ii) Shots
      iii) Frames                       iv) Snaps
   g) __________ is a technique in which one image transforms into another:
      i) Kinematics                     ii) Morphing
      iii) Animation                    iv) Layering
   h) __________ is a decision making process about when user should admitted or not.
      i) Admission control             ii) Delay
      iii) Stand alone                 iv) Synchronization
   i) In cryptography, cipher text refers to __________.
      i) Plain text                    ii) Formatted text
      iii) Clean text                  iv) Rich text
   j) Which one is a 3D animation software?
      i) Adobe Photoshop               ii) Microsoft silver light
      iii) Animation                   iv) Toon Boom

UNIT-I

Q.2 a) Explain about the multimedia system architecture in detail. 10
   b) What are the objects of multimedia? 5

Q.3 a) What are the advantages and disadvantages of multimedia? 8
   b) List out the basic software of multimedia and categorise them. 7

UNIT-II
Q.4  a) List out the differences between a plain text and a formatted text.  
b) What is OLE? Explain in detail.

Q.5  a) Write a short note on conversion in various text formats. 
b) Explain RTE syntax in detail. 
c) List all the tools used in HTML.

UNIT-III

Q.6  a) Differentiate between Lossless and Lossy compression techniques. 
b) How data compression is possible? 
c) Write a short note on bitmap image.

Q.7  a) Explain one of entropy encoding technique with an example.  
b) List some file formats used in multimedia.

UNIT-IV

Q.8  a) Discuss the principle of animation.  
b) List some 2D and 3D software. Also explain the 2D and 3D animation techniques.

Q.9  Write short notes on: 
a) Morphing. 
b) Use of animation in multimedia. 
c) Image size on quality and storage.
Q.1  a) A tree topology is a variation of a ________ topology.
    i) Mesh
    iii) Bus
    b) A television broadcast is an example of ________ transmission.
    i) Simplex
    iii) Full duplex
    c) ARQ stands for ________.
    i) Automatic repeat quantization
    iii) Automatic retransmission request
    d) DNS is the abbreviation of:
    i) Dynamic name system
    iii) Dynamic network system
    e) ________ control refers to methods of error detection and correction.
    i) Flow
    iii) Transmission
    f) Frame relay provides ________ connections.
    i) PVC
    iii) DLCI
    g) Routers functions is the ________ layer.
    i) Physical
    iii) Network
    h) In FTP, when we ________, it is copied from the client to the server.
    i) Retrieve a file
    iii) Retrieve a list
    i) ________ is the protocol suite for the current internet.
    i) TCP/IP
    iii) UNIX
    j) Which of the following is not in OSI model?
    i) Physical layer
    iii) Network layer

UNIT-I

Q.2  What do you mean by sampling? Explain PAM and PCM in sampling with a proper diagram.

Q.3  Differentiate the following:
    a) Analog and digital signal.
    b) Bus and ring topology.
    c) Bitrate and band rate.
UNIT-II
Q.4 Differentiate between OSI model and TCP/IP model. Explain network layer and presentation layer of OSI model. 15

Q.5 Write short notes on:
a) UDP
b) SMTP
c) FTP 5x3

UNIT-III
Q.6 What do you mean by routing? How is distance vector routing different from link state routing? 15

Q.7 What are virtual LANs? How are they different from LANs? State advantages and disadvantages of virtual LANs. 15

UNIT-IV
Q.8 Explain token ring concept in relation to priority, reservations, monitor stations and backup stations etc. 15

Q.9 What is packet switching? How a datagram approach is different from a virtual circuit approach? Justify your answer. 15
End Semester Examination, May 2015  
BCA – Sixth Semester  
JAVA PROGRAMMING (BCA-601A)

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 overloaded constructors in a class will have:
      i) different names  ii) different parameter lists
      iii) different return types  iv) None of the above
   b) To create our own exception class, we have to:
      i) create an own try and catch block  ii) extend exception class
      iii) use throws keyword  iv) use finally keyword
   c) Which keyword is used to monitor statement for execution?
      i) try  ii) catch
      iii) throw  iv) throws
   d) Which method is called first by an applet?
      i) start  ii) run()
      iii) init()  iv) paint()
   e) To display text on applet, _______ method is used.
   f) Java always provides a default constructor to a _______.
   g) What is Garbage collection in Java?
   h) Why do we use array as a parameter in main method?
   i) What is package?
   j) What is method overriding?

UNIT-I

Q.2 a) What is the difference between Java, C and C++?
   b) Explain the importance of JVM in Java programming.
   c) What is stand alone application?

5x3

Q.3 a) Discuss the structure of Java program.
   b) Discuss the various tools available in JDK? How do they help in application development?

7  8

UNIT-II

Q.4 a) Write a program in Java to find the addition and subtraction of two matrices.
   b) Compare: a) break and continue  b) while and do-while.

9  6

Q.5 a) What is an array? Give the format and purpose of arrays in Java.
   b) Write a program in Java to find sum and reverse of n digit numbers.

10  5

UNIT-III

Q.6 a) What are constructors used for? Can constructors be overloaded? Write a program in support of your answer.
   b) What are classes and objects? How does classes accomplish data hiding? Explain

9  6
Q.7  a) What is the difference between final, finalize and finally() in Java?  
    b) Discuss Java error handling mechanism with an example. What is the difference 
        between checked and unchecked exception handling in Java.  

**UNIT-IV**

Q.8  a) What is an interface? How is it different from an abstract class? Can an abstract 
      class have constructors? Explain.  
    b) Define the following for packages:  
       i) -Public   - private   - protected  
       -import  

Q.9  a) What is the difference between shadowing and overriding in C#.net?  
    b) Write a short note on Delegation Event Model.  
    c) What are applets? Differentiate them from application.  

End Semester Examination, May 2015
BCA -Fifth Semester
NUMERICAL ANALYSIS AND STATISTICS (BCA-504)

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 formula of Regula-Falsi method for solving non-linear equations.
b) Using Newton Raphson method construct a formula to find square root of a number N.
c) What do you mean by initial value problem?
d) Write down the relation between the operators \(E\) and \(\nabla\).
e) Write down Bessel’s interpolation formula.
f) Define divided differences.
g) State centered formula of order \(O(h^2)\) for numerical differentiation.
h) Write down expression for Simpsons three-eighth rule for numerical integration.
i) What is binomial distribution for a variate \(X\)?
j) Calculate \(P(-1 \leq z \leq 1)\) for standard normal variate \(z\).

UNIT-I

Q.2 a) Derive an iteration formula to solve \(x^3 + x^2 - 1 = 0\) and hence solve the equation. 8
b) Derive Newton-Raphson Formula to solve non-linear equations. 7

Q.3 a) Solve the initial value problem:
\[
\frac{dy}{dx} = \frac{y-x}{y+x}, \quad y(0) = 1
\]
For \(x = 0.1\) by Euler’s method. 7
b) Apply Runge-Kutta method to solve \(\frac{dy}{dx} = x^2 + y^2, \quad y(0) = 1\).
For \(x = 0.1\). 8

UNIT-II

Q.4 a) The area \(A\) of a circle of radius \(d\) is given for the following values:
\[
\begin{array}{|c|c|c|c|c|c|}
\hline
d & 80 & 85 & 90 & 95 & 100 \\
\hline
A & 5026 & 5674 & 6362 & 7088 & 7854 \\
\hline
\end{array}
\]
Calculate the area of a circle of radius 105. 7
b) Using the table given below and Newton’s Divided difference formula, find \(f(x)\) as a polynomial in \(x\):
\[
\begin{array}{|c|c|c|c|c|}
\hline
x & -1 & 0 & 3 & 6 & 7 \\
\hline
f(x) & 3 & -6 & 39 & 822 & 1611 \\
\hline
\end{array}
\]
8

Q.5 a) Using Lagrange’s formula, find the interpolating polynomial for \((0,2), (1,3), (2,12)\) and \((5,147)\). 9
b) Construct Newton's divided difference table for the data:

<table>
<thead>
<tr>
<th>x</th>
<th>4</th>
<th>1</th>
<th>0</th>
<th>2</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>y</td>
<td>1245</td>
<td>33</td>
<td>5</td>
<td>9</td>
<td>1335</td>
</tr>
</tbody>
</table>

**UNIT-III**

Q.6  

a) Find the least square fit \( y = a + bx + cx^2 \) for the data:

<table>
<thead>
<tr>
<th>x</th>
<th>-3</th>
<th>-1</th>
<th>1</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>y</td>
<td>15</td>
<td>5</td>
<td>1</td>
<td>5</td>
</tr>
</tbody>
</table>

b) Using centered formula of order \( (h^4) \), Find \( f'(1.4) \) from the following table:

<table>
<thead>
<tr>
<th>x</th>
<th>1.2</th>
<th>1.3</th>
<th>1.4</th>
<th>1.5</th>
<th>1.6</th>
</tr>
</thead>
<tbody>
<tr>
<td>( f(x) )</td>
<td>1.5095</td>
<td>1.6984</td>
<td>1.9043</td>
<td>2.1293</td>
<td>2.3756</td>
</tr>
</tbody>
</table>

Q.7  

a) Using Simpson's one-third rule, Compute \( \int_{0}^{1} \frac{1}{1+x} \, dx \) taking \( h = 0.125 \).

b) A river is 80 feet wide. The depth \( y \) in feet of the river at a distance \( x \) from one bank is given by the following table:

<table>
<thead>
<tr>
<th>x</th>
<th>0</th>
<th>10</th>
<th>20</th>
<th>30</th>
<th>40</th>
<th>50</th>
<th>60</th>
<th>70</th>
<th>80</th>
</tr>
</thead>
<tbody>
<tr>
<td>y</td>
<td>0</td>
<td>4</td>
<td>7</td>
<td>9</td>
<td>12</td>
<td>15</td>
<td>14</td>
<td>8</td>
<td>3</td>
</tr>
</tbody>
</table>

Find approximately the area \( A = \int y \, dx \) of the cross section of the river.

**UNIT-IV**

Q.8  

a) A coin is tossed five times. What is the probability of getting at least three heads?

b) Fit a Poisson distribution to the following data:

<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>( f )</td>
<td>122</td>
<td>60</td>
<td>15</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

Q.9  

Fit a normal distribution to the following data and test the goodness of fit:

<table>
<thead>
<tr>
<th>x</th>
<th>4</th>
<th>6</th>
<th>8</th>
<th>10</th>
<th>12</th>
<th>14</th>
<th>16</th>
<th>18</th>
<th>20</th>
<th>22</th>
<th>24</th>
</tr>
</thead>
<tbody>
<tr>
<td>y</td>
<td>1</td>
<td>7</td>
<td>15</td>
<td>22</td>
<td>35</td>
<td>43</td>
<td>38</td>
<td>20</td>
<td>13</td>
<td>5</td>
<td>1</td>
</tr>
</tbody>
</table>
Q.1  a) __________ parameter is used in circle function.
   i) 3.    ii) 2.    iii) 4.    iv) None of the above.

   b) __________ function is used to set the color of an image.
      i) Setbk color.   ii) Set color.
      iii) Floodfill.   iv) None of the above.

   c) There is ________ type of projection.
      i) 3.    ii) 1.    iii) 7.    iv) 4.

   d) The transformation in which an object can be rotated about origin as well as an
      arbitrary point is called as:
      i) Translation.   ii) Scaling.
      iii) Rotation.   iv) All of the above.

   e) Two consecutive scaling transformation t1 and t2 are:
      i) Additive.   ii) Subtractive.
      iii) Multiplicative.   iv) None of the above.

   f) Some common form of clipping includes:
      i) Curve clipping.   ii) Polygon clipping.
      iii) Point clipping.   iv) All of the above.

   g) The transformation that produces a parallel mirror image of an object is called:
      i) Reflection.   ii) Shear.
      ii) Rotation.   iv) Scaling.

   h) The flat panel displays are ________ in appearance.
      i) flat.    ii) Curve.
      iii) Both i) and ii).   iv) None.

   i) The speed of printing in inkjet printer is:
      i) Fast.    ii) Slow.
      iii) Neither fast nor slow.   iv) None of these.

   j) CRT stands for:
      iii) Check Ray Tube.   iv) None of the above.  

UNIT-I

Q.2  What do you mean by computer graphics? Explain different types of computer
      graphics along with its architecture.  

Q.3  a) Explain input-output devices in details.  
     b) Explain the different methods of color generation in details.  

UNIT-II

Q.4  Explain the DDA algorithm for a line drawing. What would be the intermediate point
to draw a line between (2, 6) and (8, 12)?
Q.5 What do you mean by transformation? Explain different types of transformation with examples.  

UNIT-III

Q.6 Derive the transformation matrix to scale a unit cube twice uniformly w.r.t. origin. Find the coordinate of transformed cube.  

Q.7 a) Differentiate between cavalier and cabinet projection. Why cabinet projection is more realistic than cavalier projection?  
b) What do you mean by 3D? How is it different from 2D? Explain through an example.  

UNIT-IV

Q.8 Explain the use of the following graphic functions with their syntax and examples:  
a) arc()  
b) getbkcolor()  
c) initgraph()  
d) detectgraph()  
e) cleardevice()  
f) closegraph()  
g) setfillstyle()  
h) outtext()  
i) rectangle()  
j) Fillpoly()  

Q.9 Write a program to generate /design a solar system.
Q.1 Multiple choice questions:

a) Software mistakes during coding are known as:
   i) Failures.
   ii) Defects.
   iii) Bugs.
   iv) Errors.

b) Spiral model was developed by:
   i) Bev Littlewood.
   ii) Berry Boehm.
   iii) Roger Pressman.
   iv) Victor Basili.

c) If requirements are frequently changing which model is to be selected?
   i) Waterfall.
   ii) Prototyping model.
   iii) Spiral model.
   iv) Iterative enhancement model.

d) Software engineering approach is used to achieve:
   i) Better performance of hardware
   ii) Error free software.
   iii) Reusable software.
   iv) Quality software product.

e) Cost estimation for a project may include:
   i) Software cost.
   ii) Hardware cost.
   iii) Personnel costs
   iv) All of the above.

f) Temporal cohesion means:
   i) Cohesion between temporary variables.
   ii) Cohesion between local variables.
   iii) Cohesion with respect to time.
   iv) Coincidental cohesion.

g) The relationship of data elements in a module is called:
   i) Coupling.
   ii) Cohesion.
   iii) Modularity
   iv) None of the above.

h) During validation:
   i) Process is checked
   ii) Product is checked
   iii) Developers performance is evaluated
   iv) The customer checks the product.

i) Alpha testing is done by:
   i) Customer.
   ii) Tester.
   iii) Developer.
   iv) All of the above.

j) Cyclomatic complexity is denoted by:
   i) V(G)=e-n+2P.
   ii) V(G)= \tau +1.
   iii) V(G)=number of regions of the graph
   iv) All of the above.
UNIT-I

Q.2 Discuss prototype model. What is the effect of designing a prototype on the overall cost of a software project? What are the advantages of developing prototype of a system?  
15

Q.3 a) Define the term software engineering. Discuss the techniques of software engineering. 8  
b) What is more important: Product or process? Justify the answer. 7

UNIT-II

Q.4 a) Consider a project with the following functional units:  
No. of user inputs: 50  
No. of user outputs: 40  
No. of user enquiries: 35  
No. of user files: 06  
No. of external interfaces: 04  
Assume all complexity adjustment factors and weighting factors are average.  
Compute function points for the project. 8  
b) Write a short note on PERT. 7

Q.5 Write short notes on the following:  
a) LOC.  
b) Token count.  
c) SRS. 5x3

UNIT-III

Q.6 Discuss COCOMO model with their types in detail. 15

Q.7 a) Differentiate between coupling and cohesion. 8  
b) How many types of coupling are available? What is the effect of coupling on effective modular design? 7

UNIT-IV

Q.8 a) Define error, bug, fault, defect and failure. 8  
b) What is importance of testing? 7

Q.9 a) Describe equivalence class partitioning method. Compare this with boundary value analysis technique. 8  
b) Why does software testing need extensive planning? 7
End Semester Examination, May 2015
BCA - Fifth Semester
INFORMATION AND COMMUNICATION TECHNOLOGY (BCA-501)

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) Fill in the blanks:
   i) Tele-working mean __________.
   ii) The digital divide is a ________.
   iii) EFTPOS is ________.
   iv) A cyber crime is ________.
   v) Full form of EDI is ________.  

b) State four methods of protecting the security of a computer network.  
c) Name three categories of cyber criminals.  
d) What is the network service which may be improved through the use of network audit software?  
e) Define digital signature.  

UNIT-I

Q.2 Explain Bluetooth technology. Compare Bluetooth with Wi-Fi. Are the two terms similar to each other? If they are different then list the points of difference.  

Q.3 How can we maintain address book on the internet? List the various advantages of maintaining address book in a correct order.  

UNIT-II

Q.4 Is there any difference between Wiki and Wikipedia? Write down the steps to upload an article in Wikipedia. Who maintain Wikipedia?  

Q.5 Explain the concept of E-mail. State the requirement of having an email. State the advantages and disadvantages of email. List some email supporting websites and softwares.  

UNIT-III

Q.6 Discuss the followings:
   a) Phishing  
b) Software privacy  
c) Copywriting  

Q.7 “A network service may be improved through the use of network audit software”.  
   a) Explain why network audit software is used?  
   b) Give four items of data that may be recorded by the network audit software.  

UNIT-IV

Q.8 Give a detailed note on control applications like turtle graphics, control of flights, buzzers, motors, burglar alarms, automatic washing machines and microwaves.  

Q.9 Discuss the ICT application in booking system and manufacturing industry.
Q.1 Choose the correct option:

a) Generally speaking in business we communicate:
   i) Only to inform    ii) To both persuade and inform
   iii) Only to persuade iv) Only to entertain

b) Effective communication is essentially a:
   i) Two-way process  ii) Three-way process
   iii) Both a one-way and a two-way process
   iv) One way process.

c) Speakers usually experience difficulty in ensuring that the message is:
   i) Conveyed precisely, understood correctly, and acted upon promptly and as desired.
   ii) Conveyed precisely.
   iii) Understood correctly.
   iv) Acted upon promptly and as desired.

d) The purpose of public relations is:
   i) To sell the company’s products.
   ii) To communicate with shareholders.
   iii) To project a favorable image of the company among various publics.
   iv) To communicate during a crisis.

e) Which of the following is not an indication of active listening?
   i) Egocentrism.
   ii) Engaging in conversation with the speaker.
   iii) Taking notes.
   iv) Reconstructing the information.

f) An impromptu speech means:
   i) A prepared speech delivered without any supporting aids.
   ii) A speech delivered without any preparation.
   iii) A speech delivered while referring to notes.
   iv) A speech delivered by reading from notes.

g) “A meeting without an agenda is like a ship without a destination”. This means that the meeting:
   i) Has no goal    ii) Lacks leadership
   iii) Is inconclusive iv) Is disorganized

h) A common method of measuring attitudes is by using:
   i) In-depth interviews.
   ii) Observing people’s behavior.
   iii) Semantic differential scales.
   iv) A lie detector.

i) The centrality of an attitude reflects:
   i) A person’s degree of negative or positive feelings about an object.
   ii) The extent to which an attitude is related to a person’s other attitudes.
   iii) The extent to which an attitude is a part of a person’s concept of self.
iv) The attitude’s resistance to change.

j) Reena is twice as old as Sunita. Three years ago, she was three times as old as Sunita. How old is Reena now?
   i) 6 years ii) 12 years iii) 14 years iv) 16 years  

UNIT-I
Q.2 a) Differentiate between verbal and non-verbal communication. 8 
   b) Explain the term emotional intelligence. How is it helpful in extracting best form employees? 7 

Q.3 a) What are the different levels of communication? Explain in detail. 8 
   b) “It is very important to be a team player”. Elaborate. 7 

UNIT-II
Q.4 a) How being an optimist different from being a pessimist? Elaborate. 8 
   b) Explain an incident where being optimist has helped you in real life. 7 

Q.5 Solve the followings:
   a) If a 36 inch long strip cloth shrinks to 33 inches after being washed, how many inches long will the same strip remain after washing if it were 48 inches long?  
   b) The price of Maruti car rises by 30% while the sales of the car come down by 20%. What is the percentage change in total revenue?  
   c) The total of the ages of Amar, Akbar and Anthony is 80 years. What was the total of their ages five years ago?  
   d) A pineapple costs Rs.7 each. A watermelon costs Rs. 5 each. X spends Rs. 38 on these fruits. The no. of pineapple purchased are ________?  
   e) What is the product of all the numbers in the dial of a telephone? 3x5 

UNIT-III
Q.6 a) What are the key considerations while designing a professional presentation? 8 
   b) “A presentation is prepared based on understanding of audience and the speaking occasion”. Elaborate. 7 

Q.7 a) Why do we need brainstorming before designing a presentation? How does it improve the standard of presentation? 8 
   b) How developing a logical sequence for your message leaves a better impact on the audience? Explain. 7 

UNIT-IV
Q.8 a) “Interviews play a crucial role for the employee and the employer”. Explain. 8 
   b) List the various documents that you need to carry while going for an interview. 7 

Q.9 a) What are the different types of interviews conducted in an organization? Which type of interview is best suited when the company is situated abroad? 8 
   b) How performance appraisal plays a very important role in the growth of an individual in an organization? 7
End Semester Examination, May 2015
BCA -Fourth Semester
WEB DESIGNING AND INTERNET APPLICATIONS (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) IP addresses are converted into:
   i) Binary string
   ii) Alphanumeric string
   iii) Hierarchy of domain
   iv) Hexadecimal string

b) The tag used in HTML to link other URL is:
   i) <A>
   ii) <H>
   iii) <U>
   iv) <L>

c) A web page is located using:
   i) Universal record linking.
   ii) Universal resource locator.
   iii) Universal record locator.

d) Which tag is used to arrange tags in paragraphs?
   i) <par>
   ii) <paragraph>
   iii) <P>
   iv) <a>

e) HTML stands for:
   i) Hypertext making links
   ii) Hypertext markup language
   iii) Higher textual making of links
   iv) Hyper text mixer of links

f) CSS stands for:
   i) Control stylesheets
   ii) Creative stylesheets
   iii) Cascading stylesheets
   iv) None of above

g) Which of following is not scripting language?
   i) HTML
   ii) XML
   iii) Postscript
   iv) Javascript

h) We use tag within:
   i) <head> only
   ii) <title>
   iii) <head> and <1 body>
   iv) <javascript>

i) Javascript is _________ side scripting language.
   i) Server
   ii) Browser
   iii) ISP
   iv) None of the above

j) Which of the following HTML code is valid?
   i) <font colour = "red">
   ii) <font color = "red”>
   iii) <red><font>
   iv) All of the above

UNIT-I

Q.2
Write short notes on:
   a) SMTP
   b) Usenet
   c) URL

Q.3
Write short notes on:
   a) What is internet? What are its application areas?
   b) Write a short note on internet security.

UNIT-II
Q.4  a) Explain the structure of HTML.
     b) Differentiate external and internal linking.
     c) Explain image tag and its attributes.  

Q.5  Create an admission form in HTML using buttons, textbox, radio button, checkbox and listbox with all attributes.  

UNIT-III

Q.6  a) What are frames? Insert the four web pages in the frames using appropriate examples.
     b) Differentiate between <Address> and <Blockquote> tags.

Q.7  a) Explain various character formatting tags in HTML.
     b) Differentiate between colspan, rowspan, cellspacing and cellpadding in table.

UNIT-IV

Q.8  What are cascading stylesheets? Explain the types of stylesheets in detail.

Q.9  a) Write a program in javascript for swapping of two images.
     b) Differentiate between prompt(), alert() and confirm() boxes.
End Semester Examination, May 2015
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 blank with appropriate word:
   a) An operating system is a __________ software.
   b) System calls are ___________ instructions.
   c) Long term scheduler is also called as __________.
   d) The measure used to control thrashing is __________
   e) A ___________ is a collection of related information that is stored on secondary storage.

State whether True or False:
   f) A file has a certain defined structure according to its type.
   g) External fragmentation is the cause of allocating more space than required by the process.
   h) The running processes in execution state may be suspended because of I/O or because of preemption.
   i) Banker’s algorithm is used to detect deadlock.
   j) MS-DOS supports multiprogramming.

UNIT-I

Q.2 a) Discuss advantages of multiprogramming systems.
   b) List the differences between timesharing and multiprogramming systems.
   c) What is spooling?

UNIT-II

Q.3 a) What is a Kernal? Explain its main functions.
   b) What is the purpose of command interpreter? Why is it usually separated from the Kernal?

UNIT-III

Q.4 Compare and contrast FCFS and SJF scheduling algorithms with the help of suitable examples.

Q.5 a) Define a process with examples.
   b) Differentiate between long term, short term and medium schedulers with their appropriate examples.

UNIT-IV

Q.6 Discuss the technique of paging in detail.

Q.7 Discuss:
   a) Swapping
   b) Virtual memory.

Q.8 a) Explain different types of file formats. Also give examples.
b) Explain various methods for free space management. Illustrate it with an example.

Q.9 Discuss FCFS, SCAN and CSCAN disk scheduling algorithm by taking a suitable example.
End Semester Examination, May 2015  
BCA - Fourth Semester  
E-COMMERCE (BCA-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 Answer the following questions:
   a) What does B2C stands for?
   b) Give atleast three examples of websites which provide facility for cyber cash.
   c) Name two groups in which products of e-money can be categorized.
   d) What does EFT stands for?
   e) What is the stored value of a smart card?
   f) Name three categories of the intellectual property over the internet.
   g) What is an ISP?

Fill in the blanks:
   h) ‘e-business’ is any business that is empowereby an ________.
   i) The e-check system is an ________ of the paper-check system.
   j) ________ is the number that identifies a machine on the internet.

UNIT-I

Q.2 What is an ‘e-Commerce’? What are the advantages and disadvantages of engaging in e-Commerce activity to identify new applications in business? 15

Q.3 Write short notes on the following:
   a) Implications of IT on e-business strategy. 8
   b) Porter’s value chain model. 7

UNIT-II

Q.4 What is business-to-business e-commerce? Also discuss three models of B2B e-commerce. 15

Q.5 Explain the following:
   a) EDI. 8
   b) Just-in-time delivery. 7

UNIT-III

Q.6 What are the main differences between a credit card and a debit card? Why is one type of card favored over the other? 15

Q.7 Explain the following:
   a) e-money 7
   b) Legal, ethical and other public policy issues. 8

UNIT-IV

Q.8 Identify the key steps to setup an infrastructure for the e-commerce. Which step is most critical and Why? 15

Q.9 Explain the following:
a) Virtual communities.
b) The future of e-commerce.
End Semester Examination, May 2015
BCA - Third Semester
BUSINESS ORGANIZATION AND PRINCIPLES OF MANAGEMENT (BCA-304)

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 Fill in the blanks:
a) One of the external environment factor that influence management is __________.
b) There are __________ types of degree of delegations.
c) LPG stands for liberalization, __________ and globalization.
d) All levels of management between the supervisory level and the top level of the organization are termed ____________.
e) __________ is the ability to translate knowledge into action that results in desired performance.

Choose the correct option:
f) Management is the combination of:
i) Art ii) Science iii) Profession iv) Above three

g) Which of the following is false about the characteristic of modern organizations?
i) Have little global focus.
  ii) Face simultaneous pressure for stability and change.
  iii) Some employees will find such organizations stressful.
  iv) Use the internal to manage external interactions.

h) Decision making is a primary part of the managerial process (True/False)

i) Define an informal organization.

j) Name the physical aspect of an enterprise.

UNIT-I

Q.2 What do you mean by a business? How is it different from a profession? Explain with an example. 15

Q.3 What factors affect the business system? Explain their role in context of the objectives and social responsibilities of a business. 15

UNIT-II

Q.4 Write short notes on the following (any three):
a) Organization as a system.
b) Stress as a motivator.
c) Decentralization.
d) Objectives of organizational behavior. 15

Q.5 Explain the behavioural models of decision making in an organization. 15

UNIT-III
Q.6  What is the concept of universality of a management? Give arguments for and against this concept.  

Q.7  “Management process is considered to consist of certain functions”. Explain various functions in a logical order.  

UNIT-IV  

Q.8  Why human resource management is essential for an organization? How is it different from human resource development?  

Q.9  What are the sources available to a business firm for recruiting its employees? Describe the merits and demerits of various sources.
Q.1 Multiple choice questions:
   a) The disadvantages of traditional file system is:
      i) Data redundancy
      ii) Data inconsistency
      iii) Poor data control
      iv) All of the above
   b) The responsibilities of DBA are:
      i) Deciding users
      ii) Backup
      iii) Both i) and ii)
      iv) None of the above
   c) An attribute which does not identify data uniquely is called:
      i) Secondary key
      ii) Primary key
      iii) Foreign key
   d) Which is a free formatted language?
      i) SQL
      ii) Relational algebra
      iii) Relational calculus
   e) A transaction must be in following states:
      i) Active state
      ii) Partially committed
      iii) Failed
      iv) All of the above

   State whether TRUE or FALSE:
   f) A distributed database system is a collection of sites connected through network.
   g) Third normal form is also known as PJNF.
   h) SQL offers command interface to write queries.
   i) The SQL DML provides commands for defining the relations, deleting the relations and modifying the existing relation schemes.
   j) The relational model was discovered by Dr. E.F. Codd.

   UNIT-I

   Q.2 What is data model? Explain the data structure of relational data model. Also, differentiate between Network and an Hierarchical data model.

   Q.3 Define the following with an example.
      a) Entity
      b) Attribute
      c) Foreign key
      d) Candidate key
      e) Alternate key
      f) Domain

   UNIT-II

   Q.4 Explain the term ‘relational algebra’ and various operations performed in it. Give example of each.

   Q.5 Give the format and purpose of following with examples:
      a) Alter table
      b) Group by clause
      c) Length
      d) Distinct
      e) Having clause

   UNIT-III
Q.6 Define normalization? Explain and define 1NF, 2NF, 3NF by giving suitable examples for each.  

Q.7 Explain: a) Functional dependency  
               b) BCNF  
               c) 4 NF

UNIT-IV

Q.8 What do you mean by security of database? Explain various ways of database security and recovery procedures in brief.  

Q.9 What is meant by query processing? Discuss various general strategies for query processing? Also, discuss query optimization through a suitable example.
Q.1  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 a code.
   iv) To extend the capabilities of a class.

b) Which of the following is not an ODP feature in C++?
   i) Inheritance
   ii) Polymorphism
   iii) Objects
   iv) Exceptions

c) A class can have many methods with the same name, as long as the number of parameters are different. This is known as:
   i) Method overloading
   ii) Method invocating
   iii) Method overriding
   iv) Method labeling

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) The do while loop is ideal for loop structures that:
   i) Repeat some process a fixed number of times.
   ii) Must execute some process at least one time.
   iii) Must check the loop condition before the loop body is executed.
   iv) Do all of the above.

f) What will happen when defining the enumerated type?
   i) It will not allocate memory.
   ii) It will allocate memory.
   iii) It will not allocate memory to its variables.
   iv) None of the above.

g) 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.

h) Which of the following operations could not be overloaded?
   i) i) Size of    ii) +    iii) +=    iv) ::
   i) Which is used to create a pure virtual function?
   ii) $    ii) =0    iii) &    iv) !
   j) Which keyboard is used to handle an exception?
   i) Try    ii) Throw    iii) Catch    iv) None of the above

 UNIT-I

Q.2  Explain the basic concepts of object oriented programming.  15

Q.3  Describe how data is shared by function in a procedure oriented programs.  15
UNIT-II

Q.4 Describe data types in C++ with details. 15

Q.5 Explain the function classification with the passing of arguments. 15

UNIT-III

Q.6 What is a constructor? Explain types of constructor with examples. 15

Q.7 Give a programming example that overloads == operator with its use. 15

UNIT-IV

Q.8 What is a virtual function? Write rules for a virtual function. Explain with an example. 15

Q.9 Explain in detail about exception handling in C++. 15
Q.1  a) Construct a $3 \times 3$ matrix whose elements are $a_{ij} = i + j$
   b) Define upper triangular matrix with an example.
   c) Expand $(x + y)^2$ by binomial expansion.
   d) Define Lagrange's mean value theorem.
   e) What are countable set? Explain with the help of an example.
   f) Define set bounded above.
   g) Find $x + 1_{\mathbb{R}}$
   h) What is neighborhood of a point?

   **State whether TRUE or FALSE:**
   i) A set of all positive real numbers is not bounded above.
   j) A finite set has no limit point.

**UNIT-I**

Q.2  a) Define the following terms with an example:
   i) Transpose of matrix  
   ii) Symmetric matrix  
   iii) Skew symmetric matrix
   b) For the 2 matrices $A$ and $B$ verify that $(AB)^T = B^T \cdot A^T$ where

   $$A = \begin{bmatrix} 0 & -1 & 2 \\ 3 & 0 & -1 \end{bmatrix} \quad \text{and} \quad B = \begin{bmatrix} 1 & -1 \\ 0 & 2 \\ 5 & 0 \end{bmatrix}$$

Q.3  a) How many different words can be formed with the letters of the word BHARAT?
   i) In how many of these B and H are never together.
   ii) How many of these begin with B and end with T.
   b) For the matrix $A = \begin{bmatrix} 3 & 1 \\ 7 & 5 \end{bmatrix}$, find $x$ and $y$ so that $A^2 + xI = yA$. Hence find $A^{-1}$.

**UNIT-II**

Q.4  a) Show that union of two countable sets is countable.
   b) Show that union of an arbitrary family of open sets is an open set.

Q.5  a) Show that union of a denumerable collection of denumerable sets is denumerable.
   b) Find the supremum and infimum, if exist of the following:
   i) $\{x : -5 < x < 3\}$  
   ii) $\{x : x = 4^n, n \in \mathbb{N}\}$
   iii) $\left\{1, \frac{1}{2}, \frac{1}{3}, \frac{1}{4}, \ldots\right\}$
   iv) Open interval $(0, 1)$

**UNIT-III**
Q.6
a) Show that a sequence converges if and only if it is a Cauchy’s sequence.  

b) Show that the series \( \frac{1}{3} + \frac{1}{3^2} + \frac{1}{3^3} \ldots \) converges.  

Q.7 State and prove Cauchy’s Root Test.  

**UNIT-IV**

Q.8
a) Evaluate \( \lim_{x \to \infty} x \tan \frac{1}{x} \)  
b) Show that \( \frac{x}{x+1} < \log(1+x) < x; \ x > 0 \)  

Q.9
a) Expand \( e^{2x} \) by Maclaurin’s theorem.  
b) Evaluate \( \lim_{x \to a} \frac{\log(x-a)}{\log(e^x - e^a)} \) by L’Hospital’s Rule.
End Semester Examination, May 2015
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) If order of A is MXP and order B is PXN then order of AB is ______.
b) If \[
\begin{bmatrix}
5 & 3 & 2 \\
0 & 4 & 1 \\
0 & 0 & 3
\end{bmatrix}
\]
find \(|A|\).
c) In how many ways can the letters of the word PRAISE be arranged?
d) Formula of general term in binomial expansion is ________.
e) Define monotonic increasing function with an example.
f) Define supremum and infimum of set with an example.
g) Find the convergence of sequence \(<un> = \frac{8n-3}{2n+1}\).
h) What is the limit of a sequence \(\{S_n\} = \{\frac{1}{n}; n \in \mathbb{Z}^+\}\).
i) Define the criteria for consistency of a system of linear equations.
j) Inverse of every square matrix, if it exists is unique (True/False).

UNIT-I

Q.2 a) Verify that \(A(B+C) = AB + BC\) where \(A = \begin{bmatrix} 1 & 2 \\ 0 & 4 \end{bmatrix}\), \(B = \begin{bmatrix} 1 & 3 \\ 0 & 5 \end{bmatrix}\) and \(C = \begin{bmatrix} 1 & 0 \\ 2 & 3 \end{bmatrix}\).
b) Evaluate: \(6C_1 + 6C_2 + 6C_3 + 6C_4 + 6C_5 + 6C_6\).

Q.3 a) Find the coefficient of \(x^4\) in \((x^4 + \frac{1}{x^3})^{15}\).
b) Out of 7 consonants and 4 vowels, how many words of 3 consonants and 2 vowels can be formed?

UNIT-II

Q.4 a) Prove that all real numbers in the interval \([0, 1]\) is uncountable.
b) Find the least upper bound and greatest lower bound of the followings:
   i) \(\{x : -5 < x < 2\}\)
   ii) \(\{\frac{1}{5n}; n \in \mathbb{Z}, n \neq 0\}\)
   iii) \(\{x : x = 1 + \frac{1}{n}, n \in \mathbb{N}\}\)
   iv) \(\{x = 1 - \frac{1}{n}; x \in \mathbb{N}\}\)

Q.5 a) Prove that the union of 2 countable sets is countable.
b) Prove that union of an arbitrary family of open sets is an open set.

UNIT-III

Q.6 a) State and prove Cauchy’s general principle of convergence.
b) Prove that a monotonically increasing sequence $< U_n >$ bounded above converges to its least upper bound.

Q.7  

a) Discuss the convergence of the sequence $< u_n >$ where $u_n = \frac{2n-7}{3n+2}$.

b) State and prove comparison test of 5th form of series of numbers.

UNIT-IV

Q.8  

a) Show that $\frac{x}{x+1} < \log(1+x) < x : x > 0$.

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

Q.9  

a) Evaluate $\lim_{x \to 0} \frac{1 + \sin x - \cos x + \log(1-x)}{x \tan^2 x}$.

b) Evaluate $\lim_{x \to a} \frac{\log(x-a)}{\log(e^x-e^a)}$ by L’Hospital rule.
Q.1 Choose the correct option:

a) If waste materials contaminate the source of drinking water which of the following diseases will spread:
   i) Scurvy  ii) Typhoid  iii) Malaria  iv) Anaemia

b) Which of the following wastes cannot be decomposed by bacteria to form compost?
   i) Kitchen waste  ii) Plastic and polythene bags
   iii) Dead plants  iv) Bodies of insects living in the soil

c) When trees are cut, amount of oxygen?
   i) Decreases  ii) Increases
   iii) Both a and b  iv) Remains same

d) 71% of earth surface is covered with:
   i) Land  ii) Air
   iii) Water  iv) Coal

e) Acid rain is due to:
   i) Combustion of fossil fuels  ii) Oil slick
   iii) Oxides of sulphur  iv) Nuclear wars

f) The gas associated with global warming is:
   i) CO$_2$  ii) H$_2$S
   iii) CH$_4$  iv) SO$_2$

g) Which of these is biodegradable?
   i) Cow dung  ii) Pepsi can
   iii) Plastic rubber  iv) CDs

h) Female sterilization inhibits ________ production.
   i) Egg  ii) Estrogen
   iii) Progesterone  iv) All of the above

i) Bhopal gas tragedy occurred due to:
   i) Methane  ii) Phosgene
   iii) Methyl isocyanate  iv) Methyl amine

j) Who started the Chipko movement?
   i) Kiran Bedi  ii) S.L. Bahuguna
   iii) Medha Patkar  iv) None of the above

**UNIT-I**

Q.2  

a) Why do people need to be aware about environmental issues?  
   b) Differentiate between renewable and non-renewable sources of energy.

Q.3  

a) Explain why environmental studies is made as mandatory or essential subject in the syllabus.  
   b) How can we help and save environment? Explain in detail.

**UNIT-II**
Q.4  a) Illustrate how energy flows in an ecosystem with an example.  
     b) What is a food chain? How does a food chain get effected when one of the trophic 
        level is disturbed?  

Q.5  a) Differentiate between producers, consumers and decomposers.  
     b) What is ecological pyramid? Mention atleast two types.  

UNIT-III

Q.6  a) What do you mean by pollution? Name its different types and the two major 
     causes for each type of pollution.  
     b) Mention the major reasons for global warming and climate change.  

Q.7  Write short notes on any two:  
     a) Unsustainable and sustainable development.  
     b) Wasteland reclamation.  
     c) Environmental Protection Act.  

UNIT-IV

Q.8  a) Illustrate the role of information technology in environment and human health.  
     b) What are the major causes of AIDS? Mention various symptoms and effects of 
        AIDS.  

Q.9  a) How can we control population explosion? Why do we need to control it?  
     b) Explain how increase in human population is causing increase in environment 
        pollution.
End Semester Examination, May 2015
BCA -Second Semester
DIGITAL DESIGN AND COMPUTER ORGANIZATION (BCA-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 Fill in the blanks:
   a) ________ flip-flop is used to store data in registers.
   b) The decode instruction in stored in ________.
   c) The output of a gate is low when atleast one of its input is low. It is true for ________ gate.
   d) Micro instructions are stored in ________ memory.
   e) The DMA controller has ________ registers.

Multiple Choice questions:
   f) A flip-flop has:
      i) One stable state
      ii) No stable state
      iii) Two stable state
      iv) None of the above
   g) Which of the following expression is in SOP form?
      i) \((A + B)(C + D)\)
      ii) \((A)B(CD)\)
      iii) \(AB(CD)\)
      iv) \(AB + CD\)
   h) Applying DeMorgan’s theorem to the expression \((x + y) + z\), we get:
      i) \((x + y)z\)
      ii) \((\overline{x} + \overline{y})z\)
      iii) \((x + y)\overline{z}\)
      iv) \((\overline{x} + \overline{y})\overline{z}\)
   i) Which of the following expresses the commutative law of multiplication?
      i) \(A + B = B + A\)
      ii) \(AB = B + A\)
      iii) \(AB = BA\)
      iv) \(AB = A \times B\)
   j) What are the symbols used to represent digits in binary number system?
      i) 0, 1
      ii) 0, 1, 2
      iii) 0 through 8
      iv) 1, 2

UNIT-I

Q.2 a) What is the requirement of a number system? Explain in detail.
   b) Convert: \((12.456)_{8} = (?)_{2}, (?)_{10}, (?)_{16}\)

Q.3 a) Find the addition of following unsigned binary number:
   .
      i) 1110 + 111
      ii) 11011 + 11011
   b) Perform AND, OR & XOR with two binary strings 1011100 and 10100001.
   c) Explain the concept of Hamming code with the help of an example.

UNIT-II

Q.4 Explain all the gates with their truth tables.

Q.5 Simplify the followings using K-map:
   a) \(F(A,B,C,D) = \sum 1,5,6,8,9,12\)
   b) \(F(X,Y,Z) = \sum 1,2,5,7\)
UNIT-III

Q.6  a) What do you mean by an instruction cycle? Explain its different phases in detail.  
     b) Explain different types of instructions in detail. 

Q.7  Write short notes on: 
     a) RISC  
     ii) CISC  
     iii) Subroutine calls 

UNIT-IV

Q.8  Differentiate between: 
     a) I/O and memory bus 
     b) Asynchronous and Synchronous date transfer. 
     c) Isolated and memory mapped I/O. 

Q.9  Explain the working of a DMA controller and transfer with the help of block diagram.
End Semester Examination, May 2015
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
a) One of the major strength of Visual Basic language is ________.
b) ________ and ________ are procedural languages.
c) Integer data type takes ________ bytes.
d) Static variables are ________ only once.
e) ________ is an example of string function.
f) ________ is a conditional statement.
g) The reference library of Visual Basic is called ________.
h) Menus are created using ________ in Visual Basic.
i) ________ function converts string to numerical value.
j) In ________ only one option can be selected at a time.

UNIT-I

Q.2
a) Menu Bar b) Tool Bar c) Tool Box

Q.3
Explain all the components of Visual Basic IDE (Integrated Development Environment) in detail.

UNIT-II

Q.4
a) String b) Integer c) Variant

Q.5
a) Explain the two conditional statements available in Visual Basic with the help of examples.
   b) Explain the difference between local and static variables using an example.

UNIT-III

Q.6
a) Text Box b) List Box c) Frame

Q.7
Differentiate between the followings:
a) List Box and Combo box b) Check Box and Option Button c) Label and Text Box

UNIT-IV

Q.8
Explain all the steps required to create a menu using menu editor in Visual Basic.

Q.9
Explain the following terms:
a) Data Control b) Data Grid Control c) Data Report.
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) Define cardinality of a set with an example.  
b) If \( P = \{a, b, c\} \) and \( Q = \{k, l, m, n\} \), determine \( P \times Q \).  
c) If \( A = \{\phi, a\} \), construct \( A \cup P\{A\} \).  
d) Explain the working rule of mathematical induction.  
e) If a set \( A \) has \( n \) elements, how many relations are there from \( A \) to \( A \).  
f) If \( X = \{1, 2, 3\} \), \( Y = \{8, 9\} \) and \( R = \{(1, 8), (2, 8), (1, 9), (3, 9)\} \), find \( R \).  
g) The sum of degree of all the vertices in a graph \( G \) is even. (True / False)  
h) Define path and circuit in graph.  
i) Define complete binary tree with an example.  
j) Consider the set \( A = \{4, 5, 6, 7\} \). Let \( R \) be the relation \( \subseteq \) of \( A \). Draw the Hasse diagram of \( R \).

UNIT-I  

Q.2  
a) Let \( X = \{a, b, c\} \). Define \( f : X \rightarrow X \) such that \( f = \{(a, b), (b, a), (c, c)\} \). Find: 
   i) \( f^{-1} \)  
   ii) \( f^{2} \)  
   iii) \( f^{3} \)  

b) Prove that \( 1 + 2 + 3 + 4 + \ldots + n(n+1) = \frac{n(n+1)(n+2)}{3} \) by mathematical induction.

Q.3  
a) Describe equivalence relation briefly.  
b) Let \( R \) be a binary relation on the set of all integer \( I \) such that:  
   \( R = \{(a, b) | (a-b) \text{ is even integer}\} \). Is \( R \) reflexive? Symmetric? Transitive? Equivalence relation?  
c) Prove that by mathematical induction \( n(n+1)(2n+1) \) is divisible by 6.

UNIT-II  

Q.4  
a) Consider the set \( D_{50} = \{1, 2, 5, 10, 25, 50\} \) and relation divides \( (|) \) be a partial ordering relation on \( D_{50} \).  
i) Draw Hasse diagram of \( D_{50} \) with relation divides.  
ii) Determine all upper bounds of 5 and 10.  
iii) Determine all lower bounds of 5 and 10.  
iv) Determine g.l.b of 5 and 10  
v) Determine l.u.b of 5 and 10  
b) Define sublattice. Consider the lattice of all positive integer \( I_{+} \), under the operation of divisibility. The lattice \( D_n \) of all divisor of \( n > 1 \) is a sublattice of \( I_{+} \). Determine all the sublattice of \( D_{30} \) that contain at least four elements \( D_{30} = \{1, 2, 3, 4, 5, 6, 10, 15, 30\} \).
Q.5  
\( f = ABC + B\overline{C}D + \overline{D}BC \)

a) Given the Boolean expression: 
   i) Make the truth table.  
   ii) Simplify using K-map

b) Consider the Boolean algebra \( D_{30} \), determine the followings:
   i) All the Boolean subalgebra of \( D_{30} \)
   ii) All Boolean algebras which are not Boolean subalgebra of \( D_{30} \) having at least four elements.

**UNIT-III**

Q.6  
a) Find the equation of a line passing through the point \((2,3)\) and making an angle of \(45^0\) with the line \(3x + y - 5 = 0\).

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

Q.7  
a) Two points \( A(0,0) \) and \( B(3,\sqrt{3}) \) form an equilateral triangle with another point \( P(x,y) \). Find the coordinate of \( P \).

b) Solve the differential equation: \( 2a_r - 5a_{r-1} + 2a_{r-2} = 0 \) and find particular solution such that \( a_0 = 0 \) and \( a_1 = 1 \).

**UNIT-IV**

Q.8  
a) Find the minimum spanning tree of the labeled connected graph.

b) Consider the binary tree as shown below. Draw the binary tree for each of the following operations if applied to the binary tree. Also draw the undirected graphs \( K_3 \) and \( K_5 \).
   i) Delete the node \( V \)  
   ii) Delete the node \( E \)  
   iii) Delete the root node \( R \)

Q.9  
Find the shortest path between \( a \) to \( z \) in the graph.
End Semester Examination, May 2015
BCA -Second Semester
DATA STRUCTURES (BCA-201)

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 Fill in the blanks:
   a) A stack is an ordered list in which all insertion and deletion are made at one end, called ________.
   b) Queue is a ________ list.
   c) The complexity of linear search algorithm is ________.
   d) The operation of processing each element in an array is ________.
   e) The complexity of bubble sort is ________. 1½x5

Multiple choice questions:
   f) When new data are to be insisted into a data structure, but there is no available space, this situation is called:
      i) Underflow
      ii) Overflow
      iii) Houseful
      iv) Saturated
   g) The largest element of an array index is called its:
      i) Lower bound
      ii) Upper bound
      iii) Range
      iv) None of the above.
   h) The depth of complete binary tree is given by:
      i) $n \log_2 n$
      ii) $n \log_2 n + 1$
      iii) $\log_2 n$
      iv) $\log_2 n + 1$
   i) The size of a problem is measured in terms of:
      i) Output
      ii) Input
      iii) Level of problem
      iv) Complexity
   j) Which of the following sorting procedure is the slowest?
      i) Quick sort
      ii) Heap sort
      iii) Shell sort
      iv) Bubble sort 1½x5

UNIT-I

Q.2 a) What do you mean by an algorithm? How can we measure the efficiency of an algorithm? 8
   b) Write algorithm to find largest and second largest element from a list. 7

Q.3 a) What do you mean by a circular queue? What are the advantages of circular queue over linear queue? Justify your answer. 8
   b) Convert the following infix notation into postfix notation:
      $A \ast (B + C \ast D) + E$
      Also write an algorithm for the same. 7

UNIT-II

Q.4 a) Write recursive algorithm for a binary search. Why binary search is better than linear search? Justify your answer. 10
   b) Write a short note on doubly linked list. 5

Q.5 a) Write an algorithm for inorder traversal. 5
   b) Write a short note on binary tree. 5
   c) How can we represent a polynomial using a linked list? 5
UNIT-III

Q.6 Write algorithm for merge sort. 15

Q.7 What are the various ways to represent a graph? Explain with the help of an example. 15

UNIT-IV

Q.8 a) What are the various file operations? 8

b) What are the various collision resolution methods? Explain with example. 7

Q.9 a) What do you mean by Index Sequential Access Method (ISAM)? 5

b) Differentiate between fixed and variable length record. 5

c) Hash function 5
End Semester Examination, May 2015
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 collection of readymade pictures is called ________.  
b) We can change the styles of a shape using ________ tab.  
c) The file extension of EXCEL workbook is ________.  
d) Print review is used for ________.  
e) Ctrl+s key is used for ________.  
f) DOS means DISK OPERATING SYSTEM. (True/False)

UNIT-I

Q.2 a) Explain file management through Windows.  
    7½

Q.3 a) Write short note on Windows Accessories.  
    7

UNIT-II

Q.4 a) Create a list of 10 best friends. Create a thank you letter. Use mail merge feature of MS word to create thank you letter for each of your friend from above two files.  
    10

    b) How text is formatted in MSWORD?  
    5

Q.5 Define the following terms:
    i) LINKS   ii) Headnotes   iii) Header and footer  
    iv) WIZARDS   v) Tables  

UNIT-III

Q.6 a) Explain any five mathematical functions in MS-EXCEL.  
    10

Q.7 a) Explain the following:
    i) Creating a workbook   ii) Opening a workbook  
    iii) Saving a workbook   iv) Creating and inserting a worksheet
    v) Deleting a worksheet  
    10

    b) Discuss any two date and time functions.  
    5

UNIT-IV

Q.8 a) How MS-PowerPoint is a better option for a business presentation? Discuss.  
    6

    b) Discuss the various types of views in MS-PowerPoint.  
    9

Q.9 a) Write the steps for the following:
i) Checking spelling and correcting with objects.
ii) Adding clipart and other pictures.
iii) Printing presentation.

b) Write the benefits of PowerPoint presentation.
End Semester Examination, May 2015  
BCA -First Semester  
BUSINESS COMMUNICATION-I (BCA-103)

Q.1 Choose / fill the correct option:

a) Communication starts with
   i) Message   ii) Sender   iii) Channel   iv) Feedback

b) The two broad areas of communications are:
   i) Oral and written communication.
   ii) Verbal and written communication.
   iii) Verbal and non-verbal communication.
   iv) Oral and non-verbal communication.

c) Which of the following are examples of written communication?
   i) Letters and Voicemail   ii) Reports and email
   iii) Circulars and voicemail   iv) Presentations and email.

d) All the following are external stakeholders of an organization, except:
   i) Media   ii) Government   iii) Suppliers   iv) Shareholders

e) Readability is determined mainly by:
   i) Punctuation   ii) Length of words
   iii) Active and passive voice   iv) Spelling

f) Writing style can be improved through use of:
   i) Jargon   ii) Slang
   iii) Simple words   iv) Metaphors

g) One advantage of telephone communication is:
   i) Good for problem solving
   ii) Permits use of some non-verbal cues
   iii) Conveying large amount of information
   iv) Keeping a permanent record

h) All of the following types of information can be posted on the intranet except:
   i) Employee benefits   ii) Declared holidays
   iii) Company policies   iv) Performance appraisals

d) Which of the following is not a compulsory part of a business letter?
   i) Salutation   ii) Close
   iii) Attention line   iv) Body

j) A resume summarizes the following:
   i) Strengths and weaknesses   ii) Personality
   iii) Education and experience   iv) Hobbies

Q.2 Choose correct option:

a) She looks ________ than she is.
   i) much younger   ii) very younger   iii) more young   iv) more younger

b) We were caught ________ a shower on our way home:
   i) in   ii) with   iii) at   iv) by

c) Policy, is, the, Honesty, best. (Rearrange to form a meaningful sentence)

d) Godliness, to, cleanliness, is (Rearrange to form a meaningful sentence)

e) It may ________ in the afternoon. (raining/rained/rain)

f) Boy:Girl::man: ________

UNIT-I
g) “________do you live?” ________ in India.(Fill up)

h) “________ do you come to school?” ________ by bus. (Fill up)
i) The antonym of spendthrift is ________.
j) The synonym of honest is ________.
k) Full form of ISDN is ________.
l) Full form of ERP is ________.
m) He ________ from London. (be/ is/ am/ are)
n) What is ________ dog called? (him/ her/ them/ you)
o) ________ English? (Do you be/ You are/ Are you/ Is you)

Q.3  a) Fill in each of the blanks with the correct form of present tense:
i) Janet ________ Karate class every Saturday. (attend)
ii) The market ________ usually noisy in the morning. (to be)
iii) Aanya ________ her room for the past hour. (Paint)
iv) The delivery man ________ the parcel already. (delivery)
v) You are late. The bus ________ already. (leave)

b) Convert to questions:
i) They are working hard.
ii) They will be working hard.
iii) They had worked hard.
iv) They have been working hard.

1x5

c) Rearrange the words and phrases to form meaningful sentence:
i) Last / the / week / President / Obama / of / the / USA / India / visited.
ii) He / the / went / Humayun’s / to / tomb / see / with / his.
iii) He / time / spent / with / some / the / street / in / children / an / NGO.

2x3

UNIT-II

Q.4  a) Write your first experience when you visited the collage for the 1st time and the conversation in the form of dialogues you had in Admission Cell.

b) You have to organize a business trip to Goa. Mention the conversation between the different managers for the same in the form of dialogue.

Q.5  a) Mention basic etiquettes that need to be followed while conversing either at college or outside college.

b) “People who know how to talk can easily win over hearts”. Explain

UNIT-III

Q.6  How do you define personality? What are its determinants and types?

Q.7  a) “Goal set is goal half achieved”. Do you agree with this? Justify your opinion.

b) Who is a facilitator? What are the key roles performed by him?

UNIT-IV

Q.8  a) Why do we have to design resumes with caution? What are the basic points under consideration while designing resumes?

b) Design your resume with the cover letter for the post of Software Engineer in ABC Company Ltd.
Q.9  a) Why does an organization conduct interviews? What are the different types of interviews?
     b) Explain the role of communication technology in the workplace.
End Semester Examination, May 2015
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) In a throw of dice, what is the probability of getting number greater than 5?  
b) If a set $A$ has $n$ elements, then the total number power set of $A$ is ________.  
c) Find the 7th term of sequence $2, 4, 6, 8$ ________.  
d) What is the value of $\sin\frac{3\pi}{2} + \cos\frac{2\pi}{3}$.  
e) If $\sin (x + 20) = \cos x$, find the value of $x$.  
f) The value of $\log_3 (1/125)$ is ________.  
g) If $\log_{32} x = 0.8$, then $x$ is equal to ________.  
h) If we differentiate: $y = \frac{x^4}{4} + 2x^2$, we get ________.  
i) Evaluate: $\int (5x^2 - 4x + 6)dx$  
j) The general term of G.P. is ________.  

UNIT-I

Q.2  
a) In a group of 65 people, 40 like cricket, 10 like both cricket and tennis. Find:  
i) How many like tennis  
ii) How many like tennis only and not cricket.  
b) Sum the series $0.3 + 0.33 + 0.333 + .....$ to $n$ terms.

Q.3  
a) The 5th term of a G.P is $\frac{1}{3}$ and 9th term is $\frac{16}{243}$. Find the 4th term.  
b) Find the domain and range of the following functions:  
i) $y = \frac{x^2 - 1}{x - 1}, x \neq 1$  
ii) $y = \sqrt{x}$

UNIT-II

Q.4  
a) Prove that $\sin^4 \theta - \cos^4 \theta = \sin^2 \theta - \cos^2 \theta$  
b) Solve for $x \log(4x - 3) = \log(x + 1) + \log 3$

Q.5  
a) Prove that $7 \log\frac{16}{15} + 5 \log\frac{25}{24} + 3 \log\frac{81}{80} = \log 2$  
b) In a bag, there are 100 bulbs out of which 30 are bad ones. A bulb is taken out of bag at random. Find the probability of the selected bulb to be good.

UNIT-III

Q.6  
a) Evaluate: $\lim_{x \to a} \frac{(x + 2)^{\frac{8}{3}} - (a + 2)^{\frac{8}{3}}}{x - a}$  
b) If $y = \sqrt{1 + x^2}$; Prove that $\frac{dy}{dx} = \frac{5x^4}{2y}$
Q.7  a) For what value of \( k \) is the following function continuous at \( x = 4 \):

\[
f(x) = \begin{cases} 
\frac{x^2 - 16}{x - 4} & \text{if } x \neq 4 \\
 k & \text{if } x = 4 
\end{cases}
\]

b) If \( y = (x - \sqrt{1 + x^2}) \); Prove that: \( (1 + x^2)\left(\frac{dy}{dx}\right)^2 = y^2 \)

Q.8  a) Evaluate \( \int \frac{\sin x}{(1 + \cos x)^2} \, dx \)

b) Solve the differential equation \( \frac{dy}{dx} = x \log x \)

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

b) What is Algebraic structure? Explain Groups and Rings with examples.
Q.1   
   a) MICR stands for:  
      i) Magnetic ink character reader  
      ii) Magnetic ink code reader  
      iii) Magnetic ink cases reader  
      iv) None of the above.  
   b) Which operation is not performed by a computer?  
      i) Inputting  
      ii) Processing  
      iii) Controlling  
      iv) Understanding  
   c) The binary equivalent of 74 is:  
      i) 1001011  
      ii) 1001010  
      iii) 1010101  
      iv) 1001101  
   d) Which of the following is not a logical operator?  
      i) &  
      ii) &&  
      iii) !!  
      iv) !  
   e) Which of the following can’t be checked in switch case?  
      i) Character  
      ii) Integer  
      iii) Float  
      iv) enum  
   f) Nested structures are allowed in ‘C’:  
      i) Yes  
      ii) No  
   g) Which of the following are unary operators in ‘C’?  
      i) !  
      ii) sizeof  
      iii) ~  
      iv) &&  
   h) Name any two first generation computers:  
      i) __________ is the father of computer.  
      j) CD-ROM stands for __________.  

UNIT-I

Q.2   
   a) Explain any five input devices.  
   b) What is the difference between computer and human being?  

Q.3   
   a) Explain any three output devices.  
   b) Compute the following:  

UNIT-II

Q.4   
   a) What are various problem solving approaches? Explain them with their advantages and disadvantages.  
   b) Draw a flowchart to find out sum of natural numbers.  

Q.5   
   a) Differentiate between:  
      i) Primary and secondary memory  
      ii) Algorithm and flowchart
UNIT-III

Q.6  a) Write a program to find reverse of a number and check whether it is palindrome or not? 10
     b) What are various tokens available in ‘C’? 5

Q.7  a) What do you mean by preprocessor directive? 5
     b) What are various operators available in ‘C’ language? 10

UNIT-IV

Q.8  a) What do you mean by array? What are its advantages and disadvantages? 10
     b) Explain any two library functions in detail. 5

Q.9  What is the difference between call-by-value and call-by-reference? Write a program to swap two numbers using both call-by-value and call-by-reference. 15
End Semester Examination, May 2015
BCA -First Semester
COMPUTER FUNDAMENTALS AND PROGRAMMING IN ‘C’ (BCA-101)

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) MICR stands for:
   i) Magnetic ink character reader
   ii) Magnetic ink code reader
   iii) Magnetic ink cases reader
   iv) None of the above.

b) Which operation is not performed by a computer?
   i) Inputting
   ii) Processing
   iii) Controlling
   iv) Understanding

c) The binary equivalent of 74 is:
   i) 1001011
   ii) 1001010
   iii) 1010101
   iv) 1001101

d) Which of the following is not a logical operator?
   i) &
   ii) &&
   iii) !
   iv) !!

e) Which of the following can’t be checked in switch case?
   i) Character
   ii) Integer
   iii) Float
   iv) enum

f) Nested structures are allowed in ‘C’:
   i) Yes
   ii) No

g) Which of the following are unary operators in ‘C’?
   i) !
   ii) sizeof
   iii) ~
   iv) &&

h) Name any two first generation computers:
   i) _______ is the father of computer.
   j) CD-ROM stands for _______.

UNIT-I

Q.2 a) Explain any five input devices.
    b) What is the difference between computer and human being?

Q.3 a) Explain any three output devices.
    b) Compute the following: \((11011.1101)_{2} = (?, ?)_{10} = (?, ?)_{10} = (?, ?)_{16}\)

UNIT-II

Q.4 a) What are various problem solving approaches? Explain them with their advantages and disadvantages.
    b) Draw a flowchart to find out sum of \(n\) natural numbers.

Q.5 a) Differentiate between:
   i) Primary and secondary memory
   ii) Algorithm and flowchart
UNIT-III

Q.6  a) Write a program to find reverse of a number and check whether it is palindrome or not?  
     b) What are various tokens available in ‘C’?  

Q.7  a) What do you mean by preprocessor directive?  
     b) What are various operators available in ‘C’ language?  

UNIT-IV

Q.8  a) What do you mean by array? What are its advantages and disadvantages?  
     b) Explain any two library functions in detail.  

Q.9  What is the difference between call-by-value and call-by-reference? Write a program to swap two numbers using both call-by-value and call-by-reference.
End Semester Examination, May 2015  
MCA - Fourth Semester  
CLOUD COMPUTING (MCA-4007A)

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 the following questions in one line only:  
a) Which is the most typical of cloud computing implementation?  
b) What is private cloud?  
c) Which company recently shut the doors on its cloud storage service?  
d) Hypervisor is used for __________.  
e) Give one disadvantage of virtualization.  
f) Give best definition of cloud computing.  
g) Google docs is a type of cloud computing. (True/False)  
h) Amazon cloud provider gives the service named ______.  
i) What is internal cloud?  
j) Name any three cloud leaders/providers.  

UNIT-I

Q.2 What is cloud computing? Explain all the characteristics and applications of cloud computing.  

Q.3 What are the different lists and challenges in cloud computing?  

UNIT-II

Q.4 Explain the architecture of cloud computing with the help of a suitable diagram.  

Q.5 What are the different types of clouds? Explain each cloud with its merits and demerits.  

UNIT-III

Q.6 What are the different services provided by the cloud? Explain those services with the help of examples.  

Q.7 Explain the difference between grid computing and cloud computing in detail. Discuss your answer by giving at least five suitable examples of grid computing services and cloud computing services.  

UNIT-IV

Q.8 "Security is a major challenge in the cloud”. Do you agree with the statement? If yes! Give some measures to secure the data over the cloud.  

Q.9 There are many companies in the market who are providing the cloud services to their customers. Discuss the working methodology of at least two companies in detail. Also put your views forward why you have chosen these companies.
End Semester Examination, May 2015  
MCA - Fourth Semester  
DATA COMMUNICATION AND INTRODUCTION TO NETWORK SECURITY (MCA-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 Multiple choice questions:
   a) Network layer concerns with:
      i) Bits      ii) Frames      iii) Packets      iv) None of the above
   b) MAC address is the example of:
      i) Transport layer      ii) Data link layer      iii) Application layer      iv) Physical layer
   c) Which of the following is not the networking device?
      i) Gateways      ii) Linux      iii) Routers      iv) Firewalls
   d) MAN refers to:
      i) Mega area network      ii) Metropolitan area network      iii) Mini area network      iv) Medium area network
   e) The internet is an example of:
      i) Cell switched network      ii) Circuit switched network      iii) Packet switched network      iv) All of the above
   f) Which of the following protocol is/are defined in transport layer?
      i) FTP      ii) TCP      iii) UDP      iv) Both ii) and iii)
   g) If there is only one station with a packet to send, this guarantees that there will:
      i) Never be a collision      ii) Be a collision      iii) Be an implantation      iv) Direction
   h) The method of communication in which transaction takes place in both directions, but only in one direction at a time, is called:
      i) Simplex      ii) Four wire circuit      iii) Full duplex      iv) Half duplex
   i) The topology with highest reliability is:
      i) Bus      ii) Star      iii) Ring      iv) Mesh
   j) Which of the following devices modulates digital signals into analog signals that can be sent over traditional telephone lines?
      i) Router      ii) Gateway      iii) Switch      iv) Modem

Q.2 Explain the followings:
   a) Responsibilities of data link layer and session layer.
   b) Components and characteristic of data communication.
   c) Synchronous and asynchronous TDM.

Q.3 Explain the concept of token in token ring. What will happen if the token is lost? Also discuss the concept of monitor station and frame format of token ring.
UNIT-II

Q.4 What is HDLC? Why do we need it? Explain three types of frames that are used in HDLC. Also discuss their frames format. 15

Q.5 a) What do you mean by error control? Distinguish between go-back-n and selective repeat with a diagram. 8
a) Write short notes on:
   i) TCP
   ii) LLC 3½x2

UNIT-III

Q.6 a) Find the value of \( x \) for the following sets of congruence using Chinese remainder theorem:
   \[ x = 2 \mod 7 \quad \text{and} \quad x = 3 \mod 9 \] 8
b) Using quadratic residues solve the following congruence:
   \[ x^2 = 12 \mod 17 \] 7

Q.7 a) How is Kerberos designed to provide strong authentication for client/server applications by using secret key cryptography? Also mention the short comings of Kerbos. 10
b) Explain by giving an example of each of the followings:
   i) Network spoofing
   ii) Biometric authentication 2½x2

UNIT-IV

Q.8 RSA involves a public and private key. How are these keys for RSA algorithm generated? Write down the steps in detail. 15

Q.9 Compare the digital signature and conventional signature with respect to following four parameters: inclusion, verification, relation and duplicity. 15
Q.1 Multiple choice questions:
   a) Which is created by using a single propositional symbol?
      i) Complex sentences
      ii) Atomic sentences
      iii) Composition sentences
      iv) None of the above
   b) Semantic networks is:
      i) A way of representing knowledge
      ii) Data structure
      iii) Data type
      iv) None of the above
   c) A perceptron is:
      i) a single layer feed-forward neural network with pre-processing.
      ii) an auto-associative neural network.
      iii) a double layer auto-associative neural network.
      iv) a neural network that contains feedback.
   d) The room temperature is hot. Here the hot (use of linguistic variable is used) can be represented by ________.
      i) Fuzzy set
      ii) Crisp set
   e) Where does the Bayes rule can be used?
      i) Solving queries
      ii) Increasing complexity
      iii) Decreasing complexity
      iv) Answering probabilistic query
   f) The complexity of minimax algorithm is:
      i) Same as of DFS
      ii) Same as of BFS
      iii) Same as of best-first search
      iv) Time-bm and space-bm
   g) Machine translation:
      i) Converts one human language to another.
      ii) Converts human language to machine language.
      iii) Converts any human language to English.
      iv) Converts machine language to human language.
   h) A* is optimal if h(n) is an admissible heuristic that is, provided that h(n) never under-estimates the cost to reach the goal.
      i) True
      ii) False
   i) Which is not a property of representation of knowledge?
      i) Representational verification
      ii) Representational adequacy
      iii) Inferential adequacy
      iv) Inferential efficiency
   j) Frames in AI are derived from semantic nets:
      i) True
      ii) False

UNIT-I

Q.2 How would you define “intelligence”? Do you think that computers or machines are as intelligent as humans? Justify your answer. 15

Q.3 a) Determine whether goal-driven or data-driven search would be preferable for solving each of the following problems:
   i) Diagnosing mechanical problems in an automobile.
ii) You’ve met a person who claims to be your distant cousin, with a common ancestor X. You would like to verify the claim. Justify your answer and also choose out of BFS or DFS for these examples.

b) Explain best-first search algorithm with an examples.

UNIT-II

Q.4 Make the procedural and declarative frames of the followings:
   a) for cleaning the carburetor of a scooter.
   b) for a computer lab.
   c) for making a cup of tea.
   d) frame structure of a department.

Q.5 Explain minimax search procedures in detail.

UNIT-III

Q.6 Draw the architecture of an expert system. What are the characteristics of an expert system can an ES make mistakes? Compare it with conventional systems.

Q.7 a) Compare and contrast the programming languages of Artificial Intelligence.
   b) Elucidate the various passing techniques with suitable examples.

UNIT-IV

Q.8 What is artificial neural network? What are its various types and advantages?

Q.9 Define Fuzzy reasoning. What are the various operators on Fuzzy set?
End Semester Examination, May 2015
MCA - Fourth Semester
SOFTWARE ENGINEERING AND TESTING (MCA-4002)

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) Variance from product specifications is called.
      i) Report  ii) Requirement
      iii) Defect  iv) Analysis
   b) To check whether we are developing the right product according to requirement is called:
      i) Verification  ii) Validation
      iii) Quality assurance  iv) Quality control
   c) The approach used to make sure all the requirements are covered when writing test cases.
      i) Test matrix  ii) Checklist
      iii) Test suit  iv) Traceability matrix
   d) White box testing is not called as testing.
      i) Glass box  ii) Closed box
      iii) Open box  iv) Clear box
   e) Software testing done without planning and documentation is:
      i) Adhoc testing  ii) Unit testing
      iii) Regression testing  iv) Functional testing

State whether True or False:
   f) Project risk affect the schedule or resources.
   g) Validation is a static process.
   h) Baseline document is the review and approved document.
   i) White box testing is done without going into the code.
   j) Boundary value analysis is a kind of white box testing.

UNIT-I

Q.2 Briefly explain:
   a) Component based software engineering.
   b) Software crisis.
   c) Requirement analysis.

UNIT-II

Q.3 What do you mean by a software process model? What are its requirements? Explain waterfall model in detail.

UNIT-III

Q.4 a) What do you mean by a software design? How is it helpful in creating a software product during SDLC?
   b) Write a short note on project planning and control.

Q.5 Explain the concept of COCOMO model for cost estimation in detail.
Q.6  a) Explain the principles of software testing.  
b) Write the test cases to find quadratic equation using a standard format.  

Q.7  What is functional testing? Explain the techniques of functional testing in detail.  

UNIT-IV  

Q.8  Differentiate between:  
   a) Alpha and beta testing.  
   b) Load and stress testing.  
   c) Quality assurance and quality control.  

Q.9  Explain CMM model in detail.  

End Semester Examination, May 2015  
MCA - Fourth Semester  
OBJECT ORIENTED PROGRAMMING IN JAVA (MCA-4001)

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 State whether TRUE or FALSE:
   a) A function may have any number of parameters:
   b) Each class can have only one constructor.
   c) The value of static variables cannot be changed:
   d) Final class cannot be inherited.
   e) It is mandatory to declare at least one catch in a try block:
   f) We can declare private outer class.
   g) Local variables cannot be static.
   h) A private function can be accessed only from inside that class.
   i) Applet is a type of container.
   j) Odbc stands for object database connectivity.  

UNIT-I

Q.2 a) What are the different access modifiers available in Java? How are they applied to different elements?  
   b) Explain finalize method. Why is it used? Give an example.  

Q.3 a) Explain string in Java. Discuss any three methods of string class using an example.  
   b) Explain operator precedence. Give a suitable example to emphasize the concept.  

UNIT-II

Q.4 Write short notes on the following:
   a) Checked exception.
   b) Throw.
   c) Finally.  

Q.5 Explain the concept of inheritance. How inheritances are applied in Java? Explain how interfaces provide an alternative for multiple inheritance.  

UNIT-III

Q.6 a) What are JFrames? Give an example to create a form using JFrame.  
   b) What are layout managers in Java? Explain the usage of GridBagLayout.  

Q.7 a) Explain all the methods of applet class using a suitable example.  
   b) Explain event handling using a suitable example.  

UNIT-IV

Q.8 Write short notes on the following:
   a) Driver manager.
   b) Connection.
   c) Statement.
   d) Resultset.
e) SQL exception.

Q.9  
   a) Write a short note on Servlet.
   b) Differentiate between get and post request.
Q.1 a) Find Eigen value of $A^{-1}$ if $A = \begin{bmatrix} 2 & 5 & -1 \\ 0 & 3 & 2 \\ 0 & 0 & 4 \end{bmatrix}$.

b) A eigenvalue of a matrix is 0 if the matrix is singular. Justify your answer.

c) Find the rank of the matrix $A = \begin{bmatrix} 2 & 1 & -1 \\ 0 & 3 & -2 \\ 2 & 4 & -3 \end{bmatrix}$.

d) Show that the set consisting of vectors $(1, 0)$ and $(0, 1)$ generates $V_2$.

e) Show that the following set of vectors in $V_2$ is linearly independent: $\{(1, 0), (0, 1)\}$.

f) Find standard deviation for the following discrete function:

$$x: \begin{cases} 8 & 12 & 16 & 20 & 24 \\ P(x): & \frac{1}{8} & \frac{1}{6} & \frac{3}{8} & \frac{1}{4} & \frac{1}{12} \end{cases}$$

g) A fair coin is tossed four times. Find the probability that they are all heads if first two tosses results in head.

h) The objectives of linear programming for an objective function is to:

i) Maximize or minimize

ii) Subset or proper set modeling

iii) Row or column modeling

iv) Adjacent modeling

i) In linear programming, the objective constraint are:

i) Solved ii) Linear iii) Quadratic iv) Adjacent

j) In the graphical solutions of linear, inequalities, the solution can be divided into:

i) One subset ii) Two subset iii) Three subset iv) Four subset

UNIT-I

Q.2 a) Find all value of $\mu$ for which rank of the matrix:

$$A = \begin{bmatrix} \mu & -1 & 0 & 0 \\ 0 & \mu & -1 & 0 \\ 0 & 0 & \mu & -1 \\ -6 & 11 & -6 & -1 \end{bmatrix}$$

is equal to 3.

b) Determine the value of $\lambda$ for which system of equations.

$$x + y + z = 1$$

$$x + 2y + 4z = \lambda$$

$$x + 4y + 10z = \lambda^2$$

Possesses a solution and hence find its solution.
Q.3  a) Let \( T : \mathbb{R}^2 \to \mathbb{R}^2 \) be defined by \( T(x, y) = (x + y, x - y) \). Is \( T \) one-one? If so, find formula for \( T^{-1}(x, y) \).

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 \( \mathbb{R}^3 \).

UNIT-II

Q.4  a) Diagonalize the matrix:
\[
A = \begin{bmatrix} 2 & 0 & 1 \\ 0 & 3 & 0 \\ 1 & 0 & 2 \end{bmatrix}
\]
through an orthogonal transformation.

b) Give an example to show that not every square matrix can be diagonalized by a non-singular transformation.

Q.5  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:
\[
A = \begin{bmatrix} 2 & 3 & 4 \\ 0 & 2 & -1 \\ 0 & 0 & 1 \end{bmatrix}
\]
is not similar to a diagonal matrix.

UNIT-III

Q.6  a) In partially destroyed laboratory record of an analysis of correlation data, the following regression results are legible:
- Variance of \( x = 9 \)
- Regression lines
  \[
  8x - 10y + 66 = 0 \\
  40x - 18y - 214 = 0
  \]

What were
- i) The mean value of \( x + y \)
- ii) The standard deviation of \( y \)
- iii) The coefficient of correlation between \( x + y \).

b) A random variable \( x \) has following probability function:
\[
P(x): \begin{array}{ccccccc} -2 & -1 & 0 & 1 & 2 & 3 \\ 0.1 & K & 0.2 & 2K & 0.3 & K \end{array}
\]
Find the value of \( K \) and calculate the mean and variance.

Q.7  a) The score obtained by 2 batsman A and B in matches are as follows:
\[
A: \begin{array}{cccccccccccc} 30 & 44 & 66 & 62 & 60 & 34 & 80 & 46 & 20 & 38 \\
B: \begin{array}{cccccccccccc} 34 & 46 & 70 & 38 & 55 & 48 & 60 & 34 & 45 & 30 \end{array}
\]
Determine who is more efficient and consistent.

b) Find the probability that almost 5 defective diodes will be found in a pack of 600 diodes if previous data shows that 1% of such diodes are defective.

UNIT-IV
Q.8  a) Solve the following degenerated transportation problem:

<table>
<thead>
<tr>
<th></th>
<th>D1</th>
<th>D2</th>
<th>D3</th>
<th>D4</th>
<th>D5</th>
<th>D6</th>
<th>Supply</th>
</tr>
</thead>
<tbody>
<tr>
<td>O1</td>
<td>9</td>
<td>12</td>
<td>9</td>
<td>6</td>
<td>9</td>
<td>10</td>
<td>5</td>
</tr>
<tr>
<td>O2</td>
<td>7</td>
<td>3</td>
<td>7</td>
<td>7</td>
<td>5</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>O3</td>
<td>6</td>
<td>5</td>
<td>9</td>
<td>11</td>
<td>3</td>
<td>11</td>
<td>2</td>
</tr>
<tr>
<td>O4</td>
<td>6</td>
<td>8</td>
<td>11</td>
<td>2</td>
<td>2</td>
<td>10</td>
<td>9</td>
</tr>
<tr>
<td>Demand</td>
<td>4</td>
<td>4</td>
<td>6</td>
<td>2</td>
<td>4</td>
<td>2</td>
<td>22</td>
</tr>
</tbody>
</table>

b) Use duality to solve the following LPP:

Maximize:

\[ z = 2x_1 + x_2 \]

Subject to constraints:

\[ x_1 + 2x_1 \leq 10 \]
\[ x_1 + x_2 \leq 6 \]
\[ x_1 - x_2 \leq 2 \]
\[ x_1 + 2x_2 \leq 1 \]

and \( x_1, x_2 \geq 0 \)

Q.9  a) Solve the following LPP by 2 phase method:

Maximize:

\[ z = 6x_1 + 4x_2 \]

Subject to constraint:

\[ x_1 + x_2 \leq 5 \]
\[ x_2 \geq 8 \text{ and } x_1, x_2 \geq 0 \]

b) Express the following LPP in standard form for \( n \) and determine the vertices algebraically:

Maximize:

\[ u = 4x + 3y \]

Subject to constraint:

\[ x + y \leq 4 \]
\[ -x + y \leq 2 \text{, and } x, y \geq 0 \]
Q.1 Multiple choice questions:
   a) The internal components of the processor are connected by:
      i) Processor intro-connectivity circuitry
      ii) Processor bus
      iii) Memory bus
      iv) RAM bus
   b) What is the minimum number of flip-flops required in a counter to count 100 pulses?
      i) Five ii) Seven iii) Ten iv) Hundred
   c) The unit which decodes and translates each instruction and generates the necessary enable signals for ALU and other units is called:
      i) Arithmetic unit ii) Logical unit
      iii) Control unit iv) CPU
   d) A ________ is a digital circuit that performs the inverse operation of decoder.
      i) Multiplexer ii) Adder
      iii) Subtractor iv) Encoder
   e) The addressing mode, where you directly specify the operand value is:
      i) Immediate ii) Direct
      iii) Definite iv) Relative
   f) ________ is a single address space for storing both memory and I/O devices.
      i) Memory mapped I/O ii) Isolated I/O
      iii) Separate I/O iv) Optimum I/O
   g) The DMA transfer technique where transfer of one word data at a time is called:
      i) Cycle stealing ii) Memory stealing
      iii) Hand-shaking iv) Inter-leaving
   h) A stack-organised computer uses instruction of:
      i) Indirect addressing ii) Two addressing
      iii) Zero-addressing iv) Index addressing
   i) Cache memory enhances:
      i) Memory capacity ii) Memory access time
      iii) Secondary storage capacity iv) Secondary storage access time
   j) The pipeline process is also called:
      i) Superscalar operation ii) Assembly line operation
      iii) Von Neumann cycle iv) None of the above

   1½x10

UNIT-I

Q.2 What do you understand by a flip-flop? Explain different types of flip-flops in brief.

Q.3 Simplify the following Boolean function in product of sum form by means of a four variable map:
   i) \( F(w, x, y, z) = \pi(2, 3, 4, 5, 7, 12, 14) \)
ii) \( F(w, x, y, z) = \pi(1, 3, 5, 8, 11, 13) \)

**UNIT-II**

Q.4 Explain different types of addressing nodes with example of each.  
Q.5 What is an instruction? Explain its various parts. Describe instruction cycle in detail.

**UNIT-III**

Q.6 What are the three modes of transfer? Explain them in detail.  
Q.7 What are the various ways of asynchronous data transfer? Explain in detail.

**UNIT-IV**

Q.8 Explain Flynn’s classification of computers. Describe four segment instruction pipelines with an example.  
Q.9 Write short notes on:  
a) Interleaved memory organization.  
b) Reservation table.  
c) Linear pipeline.
Q.1 a) List two home appliance devices that probably have an operating system controlling their functions.
   1
b) List four hardware devices on a home computer that its operating system has to initialize when it is turned on.
   2
c) Define the term: CPU scheduling.
   2
d) Name four disk scheduling algorithms.
   2
e) Differentiate between CUI and GUI.
   2
f) List four major file operations.
   2
g) List up major features of UNIX operating system.
   2
h) List different types of file access methods.
   2

UNIT-I

Q.2 a) What is the main advantage of the layered approach to an operating system design?
   7
b) Explain different components of an operating system.
   8

Q.3 Discuss the following operating systems:
   a) Multiprocessing
   b) Time sharing
   c) Real time
   5x3

UNIT-II

Q.4 Discuss Round Robin scheduling in detail with the help of an example. Also calculate the average waiting time and average turn around of the processes used in the example.
   15

Q.5 a) What are the characteristics of a deadlock? Give conditions under which a deadlock would occur.
   7
b) What is a kernel? Explain its main functions.
   8

UNIT-III

Q.6 a) What is fragmentation? What are types of fragmentation?
   9
b) What do you understand by a virtual memory?
   6

Q.7 Discuss:
   a) Physical and logical address.
   b) Dynamic loading and dynamic binding.
   c) Physical and logical memory.
   5x3
UNIT-IV

Q.8 Suppose the head of moving head disk with 200 tracks, numbered 0 to 199 is currently serving a request at track 143 and has just finished a request at track 125. If the queue of requests is kept in the FIFO order: 86, 147, 91, 177, 94, 150, 100, 175, 130
What is total head movement to satisfy these requests for the following disk scheduling algorithm:
   a) FCFS
   b) SSTF
   c) C-SCAN

Q.9 a) What are the main characteristics of capability lists and access lists?
   b) What do you understand by a file? What are the different file operations? Discuss in detail.
End Semester Examination, May 2015
MCA - Third Semester
WEB APPLICATION DEVELOPMENT USING PHP (MCA-3002)

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) CSS stands for:
      i) Control style sheets
      ii) Creative style sheets
      iii) Cascading style sheets
      iv) None of the above
   b) A web page is located using:
      i) Universal record linking
      ii) Uniform resource locator
      iii) Universal record locator
      iv) Uniformly reachable links
   c) PHP stands for:
      i) Php hypertext processor
      ii) Php hypertext preprocessor
      iii) Php hyper markup preprocessor
      iv) Php hypertext processor
   d) Which of the following statements prints in PHP?
      i) Out
      ii) Right
      iii) ECHO
      iv) Display
   e) In PHP, variables name starts with:
      i) ! (exclamation)
      ii) & (ampersand)
      iii) * (asterisk)
   f) In PHP, variables are case-sensitive:
      i) True
      ii) False
      iii) Depends upon website
      iv) Depends upon server
   g) We use tag within:
      i) <head> only
      ii) <head> and </body>
      iii) <title>
      iv) <Javascript>
   h) Which tag is used for arranging tags in paragraphs?
      i) <par>
      ii) <paragraph>
      iii) <p>
      iv) <a>
   i) The tag used in HTML to include external style sheet is:
      i) <ext>
      ii) <link>
      iii) <include>
      iv) <a>
   j) Which of the following is not the scope of variable in PHP?
      i) Local
      ii) Global
      iii) Static
      iv) Extern

UNIT-I

Q.2 a) Differentiate between internal and external links.
b) Explain image tag with its attributes.
c) Differentiate between ordered and defined tests with their attributes.
   5x3

Q.3 What are cascading style sheets? Explain the types of style sheets with examples. 15

UNIT-II

Q.4 a) Explain ECHO() and PRINT() functions in detail. 5
b) Explain conditional statements of PHP with an example.  

Q.5  
a) List and explain possible data types available in PHP.  
b) What is variable? How variables are declared in PHP? Explain.  

UNIT-III  

Q.6  
a) How strings are declared in PHP? Explain string operators.  
b) Explain various string functions with an example.  

Q.7  
a) Explain file handling functions with an example.  
b) Differentiate between classes and objects with examples.  

UNIT-IV  

Q.8  
Write short notes on:  
a) Try  
b) Throw  
c) Catch  

Q.9  
a) What are DML statements? What are DML statements available in MySQL?  
b) Write a short note on USE and SHOW command.  

End Semester Examination, May 2015  
MCA - Third Semester  
DATA STRUCTURES (MCA-3001)

Time: 3 hrs  
Max Marks:  
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 basic problem of space utilization has been removed by:
      i) Stack        ii) Circular queue
      iii) Simple queue iv) None of the above
   b) What algorithm is used in queue?
      i) FILO        ii) LIFO         iii) FIFO        iv) LILO
   c) A stack can not be used to:
      i) Evaluate an arithmetic expression in postfix form.
      ii) Implement recursion.
      iii) Convert infix to postfix.
      iv) Allocate resources by operating system.
   d) Which of the following data structure store the homogeneous data elements?
      i) Array        ii) Record       iii) Pointers     iv) None of the above
   e) When new data is to be inserted into a data structure, but there is no available space; this situation is usually called:
      i) Underflow    ii) Overflow

   State whether True or False:
   f) Queue is used in BFS graph.  
g) In stack, we insert data from top end.  
h) AVL tree is a special type of binary tree.  
i) We can traverse in either direction in single linked list.  
j) The situation when in a linked list START=NULL is overflow.  

1½x10  

UNIT-I  

Q.2  a) Define sorting. Sort the following data in ascending order using radix sort method.  
170, 324, 117, 346, 219, 431, 905, 678, 418, 125.  
   b) Compare top-down approach and bottom-up approach.  

Q.3  a) Suppose A is two dimensional array with 20 rows and 4 columns. Each element of array is stored in 4 memory locations. If base address is 500, find address of A[14, 2] using row-major order.  
   b) Define heap property. Write an algorithm to sort the list using heap sort method.  

UNIT-II  

Q.4  Given the following arithmetic expression in infix notation:  
$12/(7-3)+2*(4+7)-7$.  
Translate this expression into postfix notation and then evaluate it.  

Q.5  a) What is linked list? Discuss advantages of linked list. How linked lists can be used for polynomial manipulation? Give an example.  

7
b) What is double linked list? What are advantages of double linked list? How double linked lists are different from linked list?  

UNIT-III

Q.6  
a) Construct AVL tree for the following:
   4, 3, 1, 6, 9, 12, 14, 18, 17, 50  
b) Define the following terms with an example:  
i) Full binary tree.
ii) Depth and height of tree.  

Q.7  
a) What is binary tree? Given below the in-order and preorder traversals of a binary tree:
   In order → EACKFHDBG
   Preorder → FAEKCDHGB
   Draw the binary tree. Show every step.  
b) What are threads? How threads are important in binary tree? Give an examples.  

UNIT-IV

Q.8  
a) What is hashing? List various types of hashing techniques. Explain any three with example.  
b) Compare different file organization methods.  

Q.9  
a) Write an algorithm to traverse the graph using BFS.
b) What do you understand by graph coloring? Give an example.
c) Define: multigraph and directed graph.  

Q.1 a) Which of the following is /are registered by equipment identity register (E/R)?
   i) Equipment data.  
   ii) Subscriber data. 
   iii) Maintenance data.  
   iv) Performance data. 

b) In a ________ communication system, a geographical area is subdivided into small regions where each small region is called as a cell.
   i) Radio.  
   ii) Cellular. 
   iii) LAN.  
   iv) WAN. 

c) BTS stands for:
   i) Base transceiver station.  
   ii) Base transport systems. 
   iii) Base term station.  
   iv) Base task system. 

d) ______ stores all static information about a user as well as his or her current location.
   i) HLR  
   ii) VLR  
   iii) SUMR  
   iv) CLR 

e) RTS stands for:
   i) Request to send.  
   ii) Request to simple. 
   iii) Reply to send.  
   iv) Reply to single. 

f) In which year GSM was founded:
   i) 1982.  
   ii) 1981 
   iii) 1992  
   iv) 1980 

g) Using ______ a mobile phone can be connected to PDA or laptop.
   i) Wired  
   ii) Wireless piconets. 
   iii) Wireless WAN.  
   iv) Wireless MAN. 

h) Full form of PLCP is ________.

i) The basic access method of 802.11 MAC layer is _______.

j) Route discovery in DSR is done with the help of _______ the message.  
   \[1\frac{1}{2}\times10\]

UNIT-I

Q.2 a) What is the difference between GSM and GPRS? What are network elements in GPRS that are different from GSM?  
   \[10\] 

b) Write a short note on cellular networks.  
   \[5\] 

Q.3 What are different tiers in a three tier architecture of mobile computing? Describe the functions of these tiers.  
   \[15\] 

UNIT-II

Q.4 a) Wireless LAN can be defined in terms of adhoc mode and infrastructure mode. Explain.  
   \[7\] 

b) Explain security mechanism in wireless LAN.  
   \[8\] 

Q.5 a) What are the areas under which we use wireless LAN? How are these areas benefited with the uses of WLAN?  
   \[8\]
b) Write a note on wireless markup language.

UNIT-III

Q.6 What are the three techniques used in location based services? Explain them with a suitable diagram and an example.

Q.7 a) Differentiate between TCP and wireless networks through a diagram.
   b) How do you locate and organize services in location based services? Give a suitable example.

UNIT-IV

Q.8 a) What are the differences between proactive routing protocol and reactive routing protocol?
   b) State at least five problems encountered using message routing in wireless adhoc networks.

Q.9 Explain the following tricks in relation to adhoc networks:
   a) Source routing.
   b) Clustering.
   c) Local search.
   d) Asymmetric links.
   e) Smarter updates.
Q.1  Multiple choice questions:
a) Which software development life cycle model will require to start testing activities when starting development activities itself.
   i) Waterfall model  ii) Spiral model
   iii) V-model  iv) Linear model
b) Test should be conducted for every possible:
   i) Input  ii) Output
   iii) Both input and output  iv) For statements
c) Software testing which is done without planning and documentation is known as:
   i) Adhoc testing  ii) Unit testing
   iii) Regression testing  iv) Functional testing
d) User acceptance testing is:
   i) White Box  ii) Black Box
   iii) Grey testing  iv) None of the above
e) BVA is based upon:
   i) Single fault assumption  ii) Multi fault assumption
   iii) Both of the above  iv) None of the above
f) Which one is not the verification activity?
   i) Review  ii) Path testing
   iii) Walkthrough  iv) Acceptance testing
g) Information to the developer which bug to be fix first is called as:
   i) Severity  ii) Priority
   iii) Fix ability  iv) Traceability
h) Testing a system with live data is done using:
   i) Static testing tools  ii) Dynamic testing tools
   iii) Both i) and ii)  iv) None of the above
i) Which is non-functional software testing:
   i) Unit testing  ii) Black box testing
   iii) Performance testing  iv) Regression testing
j) Retesting the entire system/software after a change has been made called as:
   i) Full-regression  ii) Unit-regression
   iii) Regional regression  iv) Retesting

UNIT-I

Q.2  a) Why does testing needs an extensive planning? Comment on this.  7
     b) How do you support destructive approach for software testing?  8

Q.3  A system was designed and developed for a book store. The system is mainly responsible for inventory of book and focused on accounts payable. Considering this system, evaluate the procedure and methodology used in testing the system.  15

UNIT-II
Q.4 A program reads the data of employees in a company by taking following inputs and print them:
Name of the employee (max 15 characters a to z underscore), employee ID (10 characters), Designation (upto 20 characters). Design all possible test cases for all the three inputs. 15

Q.5 Consider a function in C to find the grades of a student for this function. Draw DD graph and calculate the cyclometric complexity. Using cyclometric complexity list the independent paths. 15

UNIT-III

Q.6 In combinational integration regression testing, describe the effect of test case generation and prioritization. 15

Q.7 a) “Performance testing is done to break the system”. Comment on this. 5
b) Design and execute checklist for testing a Facebook web application home page. 10

UNIT-IV

Q.8 A bank President has been getting complaints about the long lines in the bank cash counters. He wants to determine whether an alternative solve the problem. The Analyst wants to prepare a computerized system in place of manual system. Which standard software development process will be followed by the Analyst to solve the problem. Explain the process in detail. 15

Q.9 What are the factors that determine the quality of a software and each software meets certain criteria? What is the best model for software quality in order to ensure that system will meet its criteria? 15
End Semester Examination, May 2015  
MCA - Fifth Semester  
DATA MINING AND DATA WAREHOUSING (MCA-503)

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) Removing duplicate records is a process called ______.
b) Treating incorrect or missing data is called as _______.
c) The absolute number of transactions supporting X in T is called _______.
d) The left hand side of an association rule is called as _______.
e) The first phase of Apriori algorithm is _______.
f) ________ is a clustering algorithm.
g) Web content mining describes the discovery of useful information from the _____ contents.
h) Spatial data includes _______ and _______.
i) Usage of data mining techniques used in education sector is known as _______.
j) Example of constructed data is _______.

1½x10

UNIT-I

Q.2  
a) Explain the importance of metadata in a warehouse.  
5  
b) What is OLAP? Explain the difference between OLTP and OLAP.  
10

Q.3  
Differentiate between the following:
a) Star schema and snow flake schema.  
7  
b) Snowflake schema and fact constellation schema.  
8

UNIT-II

Q.4  
Explain the architecture of data mining system in detail.  
15

Q.5  
What is data cleaning? Explain the types of data related problems handled in this step of data preprocessing.  
15

UNIT-III

Q.6  
What do you understand by accuracy of a classifier? Also illustrate the use of confusion matrix to measure the accuracy of a classifier.  
15

Q.7  
What is a cluster? What is Clustering? Why clustering is called a unsupervised learning? List the requirements which a good clustering technique should satisfy.  
15

UNIT-IV

Q.8  
What is a web mining? Explain the classes and usage of web mining.  
15

Q.9  
Explain the difference between text-mining and web-content mining.  
15
Q.1  
a) The complexity of quick sort algorithm is:
   i) \(O(n)\)
   ii) \(O(\log n)\)
   iii) \(O(n^2)\)
   iv) \(O(n \log n)\)  
b) Which is of the sorting algorithm of divide and conquer type?
   i) Bubble sort.
   ii) Insertion sort.
   iii) Quick sort.
   iv) All of the above.

c) Coloring of the vertices of graph \(G\) using the fewest possible no of colors:
   i) Optimal coloring.
   ii) Best coloring.
   iii) Planer coloring.
   iv) None of the above.

d) A binary tree whose every node has either zero or two children is called:
   i) Complete binary tree.
   ii) Binary search tree.
   iii) Extended binary tree.
   iv) None of the above.

e) An adjacent matrix representation of graph can not contain information of:
   i) Nodes.
   ii) Edge.
   iii) Direction of edge.
   iv) Parallel edge.

f) Adjacency list can be implemented using __________.

g) Two strategies of branch and bound are _________ and _________.

h) Dynamic programming use _________ optimization.

i) Case does not exist in complexity theory, is __________.

j) According to strassen’s method the complexity of matrix multiplication is _________.

UNIT-I

Q.2  
a) Why there is a refreshment of asymptotic notation?  
b) Derive the complexity of Strassen’s matrix multiplication method.

Q.3  
Draw the state space tree representation of merge sort algorithm. Analyze its complexity using recurrence relation. Also write the algorithm for the same.

UNIT-II

Q.4  
Consider the graph and solve travelling salesman problem using dynamic programming approach.
Q.5  a) Write an algorithm for 0/1 knapsack problem using dynamic programming approach.  
    b) What are the various methods to find minimum spanning tree? Also explain with the help of an example.

UNIT-III

Q.6  a) What is a 4 planer graph problem?  
    b) Write algorithm for graph coloring and also explain with the help of an example.

Q.7  Find the LC and FIFO solution for the following data:  
n=4 and m=15.
Profit 10 10 12 18
Weight 2 4 6 9

UNIT-IV

Q.8  State and prove Cook’s theorem.

Q.9  a) Explain the relationship between P, NP-complete and NP Hard.  
    b) Differentiate between P and NP classes.
End Semester Examination, May 2015  
MCA - Fifth Semester  
COMPONENT BASED TECHNOLOGIES (MCA-501)

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) JIT compiler is a part of the run time environment:  
   i) True.  
   ii) False.

b) What is MSIL?  
   i) Multi socket interface library.  
   ii) Microsoft intermediate language.  
   iii) Microsoft interface language.  
   iv) None of the above.

c) Defining two methods with the same name but with different parameters is called:  
   i) Loading.  
   ii) Overloading.  
   iii) Multiplexing.  
   iv) Duplexing.

d) Which method do you invoke on the data adapter control to load your datanet?  
   i) Execute query.  
   ii) Read.  
   iii) Fill.  
   iv) None of the above.

e) Multiple inheritance is not allowed in .Net.  
   i) True.  
   ii) False.

f) A _______ block enclose the code that could throw an exception.  
   i) Try.  
   ii) Catch.  
   iii) Exception.  
   iv) Error.

g) CTS stand for:  
   i) Common type system.  
   ii) Combined type system.  
   iii) Common time system.  
   iv) None of the above.

h) Using keyword is used for:  
   i) Using a class of another name space.  
   ii) Using a class in same name space.  
   iii) Using a function of the same class.  
   iv) Using is not a keyword.

i) Data reader class is used in connection oriented query execution.  
   i) True.  
   ii) False.

j) HTTP stands for:  
   i) Hypertext transfer protocol.  
   ii) Highlighted text transfer protocol.  
   iii) File transfer protocol.  
   iv) None of the above.

**UNIT-I**

Q.2  

Explain the concept of name space. What is the importance of using a name space?  
How is a name space declared and used?  

1½x10

Q.3  

Write short notes on the following:  
   a) C.T.S.  
   b) J.I.T.  
   c) Array  
   d) Constructor.  
   e) Internal.  

3x5
UNIT-II

Q.4  a) What is a delegate? What is it used for? What are the steps involved in creating and using a delegate?  
     b) Write a short note on partial class.  

Q.5  Write short notes on the following:  
a) Garbage collection.  
b) Virtual function.  
c) Interface.  

UNIT-III

Q.6  a) What are connected and disconnected methods of querying? Use examples to demonstrate the difference.  
b) What is a dataset? Explain the structure and usage of a dataset with an example.  

Q.7  Write short notes on:  
a) Data adapted.  
b) Data reader.  
c) COM-DCOM.  

UNIT-IV

Q.8  a) Differentiate between ASP and ASP.NET.  
b) What are the different types of components available in ASP.NET? Explain with example.  

Q.9  a) What are implicit and explicit object in ASP.NET? Describe any five implicit objects in ASP.NET.  
b) Explain the different ways of state-management in ASP.NET.
End Semester Examination, May 2015
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 Fill in the blanks:
   a) Three D’s of security are ________, ________ and ________.
   b) One password based system is ________.
   c) PKI stands for ________.
   d) Full form of virus is ________.
   e) The value of $\phi 260$ is ________.
   f) The common algebraic structures are ________, ________, ________.
   
   **UNIT-I**

Q.2 a) What are the four problems related to network security? Explain the meaning of each of them.  
   b) Differentiate between worms and viruses.  

Q.3 What is denial of service attack (DOS)? Briefly explain the common method of it and how is it implemented. Give examples.

**UNIT-II**

Q.4 What do you understand by a certificate based authentication? Explain the steps involved with a suitable diagram.

Q.5 How is Kerberos designed to provide a strong authentication for client/server applications by using secret key cryptography? Also mention the shortcomings of Kerberos in detail.

**UNIT-III**

Q.6 Write short notes on:
   a) Message Digests  
   b) Hash functions  
   c) Transposition ciphers.
   
   **UNIT-IV**

Q.6 Write short notes on:
   a) Message Digests  
   b) Hash functions  
   c) Transposition ciphers.

Q.7 What are the various asymmetric key algorithms? Explain any one asymmetric key algorithm with a suitable example and diagram.

Q.8 Using the extended Euclidean algorithm, find GCD of the following pairs and the value of ‘s’ and ‘t’:
   a) 291 and 42  
   b) 140 and 10
   
   Q.9 Find the value of x for the following set of congruence using Chinese remainder theorem:
   a) $x=2 \mod 7$ and $x=3 \mod 9$  
   b) $x=7 \mod 13$ and $x=11 \mod 12$
Q.1 Answer the following in maximum 20 words:
   a) What are various categories of data models?
   b) What is the use of normalization?
   c) Define cardinality in DBMS.
   d) How many types of data independence are there in DBMS?
   e) Define an Alert

Choose the correct option for the following:
   f) BCNF refers to:
      i) Atomicity
      ii) Primary key
      iii) Overlapping candidate key
      iv) None of the above
   g) Which of the following is the assignment operator in oracle?
      i) =
      ii) :=
      iii) ==
      iv) None of the above
   h) Function will return value by using which statement:
      i) IN
      ii) OUT
      iii) RETURN
      iv) IN OUT
   i) A PL/SQL statement is terminated with:
      i) END
      ii) STOP
      iii) BREAK
      iv) None of the above
   j) Oracle data types include:
      i) VARCHAR2
      ii) LONG
      iii) BLOB
      iv) All of the above

UNIT-I

Q.2 What are the basic normalization techniques? Explain each with suitable database. 15

Q.3 Explain the distinction between specialization and generalization concept using a suitable ER model. 15

UNIT-II

Q.4 Explain the following SQL commands with proper syntax and an example:
   a) CREATE  b) ALTER  c) GRANT  d) INSERT INTO  e) UPDATE 3x5

Q.5 Explain all relational operators and logical operators used in SQL with using a student database. 15

UNIT-III

Q.6 What are conditional control statements in PL/SQL? Explain with an example. 15

Q.7 What is the importance of functions? What is the syntax to create local and stored functions? Explain with an example. 15

UNIT-IV

Q.8 What are reports? What are its types? Explain with proper examples. 15
Q.9 Explain the procedure to create a login screen with an example and also write a short note on form builder.
End Semester Examination, May 2015
MCA - Fourth Semester
ADVANCED JAVA TECHNOLOGIES (MCA-403)

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 State whether TRUE or FALSE:
   a) Size of int is 4 bytes in Java.
   b) Java is a platform independent language.
   c) Java is an object oriented language.
   d) Default members are accessible by all the classes of the same package.
   e) Outer classes can only be public or default.
   f) It is mandatory to define at least one constructor in every class.
   g) It is not required to free allocated space in Java.
   h) There are no destructors in Java.
   i) Applets are used to create GUI program.
   j) Throw statement is used to manually throw exceptions. 1½x10

UNIT-I

Q.2 Write short notes on the following:
   a) Operator precedence.
   b) Method overloading.
   c) ‘thin’ and ‘super’ keywords. 5x3

Q.3 a) Explain any three methods of string class with examples. 8
   b) What are finalizers? Why are they used? Explain with suitable examples. 7

UNIT-II

Q.4 What are interface? How is an interface declared? Discuss the importance of interface in multiple inheritance using a suitable example. 15

Q.5 What is an exception? How are exception handled in Java? Explain with a suitable example. 15

UNIT-III

Q.6 Write short notes on the following:
   a) JButton.
   b) JTextField.
   c) JFrame. 5x3

Q.7 a) What are input stream classes? What is the importance of input stream? 8
   b) Write a short note on layout manager. 7

UNIT-IV

Q.8 Write a program to demonstrate the database connectivity using MYSQL database and Api. 15
Q.9  a) Explain the life cycle of a servlet.
b) Write a short note on JSP.
End Semester Examination, May 2015  
MCA - Fourth Semester  
ARTIFICIAL INTELLIGENCE (MCA-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 blank with appropriate word:
   a) AI is a technique that exploits _______.
   b) A ________ is a technique that improves the efficiency of search process.
   c) The legitimate expressions of the predicate logic are called ________.
   d) Neural networks are models of human ________.
   e) Expert system use ________ rather than data.
   f) Alpha beta pruning ________ the search space.
   g) A transition network is like a ________.
   h) Bayes theorem is used for computation of ________.
   i) Acceptable states in state space are called ________ states.

   **State true or false:**
   j) The process of determining the correct meaning of an individual word is called word sense disambiguation.

   1½x10

UNIT-I

Q.2 How will you solve the following cryptarithmetic problem using constraint satisfaction?
   S E N D
   + M O R E
   -------------
   M O N E Y
   -------------

   Show the rules for propagating constraints at every step.

   15

Q.3 a) Explain the difference between ‘blind search’ and ‘heuristic search’ techniques.
   b) Discuss different AI task domains in detail.

   6
   9

UNIT-II

Q.4 What are various knowledge representation schemes? Explain by giving their advantages and disadvantages.

   15

Q.5 a) What are the components of game playing?
   b) What is minimax strategy? How is it used in game playing?

   5
   10

UNIT-III

Q.6 a) What are the applications of natural language processing? Discuss.
   b) What are the fundamental problems in using NLP based system?

   7
   8

Q.7 a) Explain the expert system architecture with the help of a block diagram.
   b) What is the difference between ‘forward chaining’ and ‘backward chaining’?

   10
   5

UNIT-IV

Q.8 Write short notes on: a) Fuzzy logic  b) Hop field network

   15
Q.9 Explain the Bayesian method by discussing Bayes theorem with the help of a suitable example. What are the advantages and disadvantages of Bayesian methods?
Q.1 a) Visual Basic is ________ language.
b) One or more option button controls can be selected from ________ choices.
c) ________ bar contains a set of tools to provide controls in the form.
d) Debug window is the same as ________ window.
e) A module level is available to all the ________ in the module.
f) Code window consists of a ________ box and procedure list box.
g) The ________ statement checks in the module for usage of an undeclared variable and reports an error to the user.
h) Dynamic arrays can be declared when the user may not know the ________ of the array at design time.
i) ________ function translates a string to a number.
j) All the controls in an array will have the same ________.

UNIT-I

Q.2 Explain the following terms:
a) Event        b) Menu bar        c) Tool bar 5x3

Q.3 Explain the important features of visual basic in detail. 15

UNIT-II

Q.4 a) Explain five important properties of a Text Box. 5
b) Explain the difference between ‘event procedure’ and ‘general procedure’ with an example. 10

Q.5 a) What is MDI form? Explain the need of MDI form. 5
b) List two advanced activeX controls with their usages. 10

UNIT-III

Q.6 a) List five important data types available in Visual Basic with their storage details. 5
b) What is an array? What is a control array? List the differences between an array and a control array. 10

Q.7 a) What is a branch statement? Give an example where unconditional branch statement is used. 5
b) Explain the following terms:
   i) Variable  ii) Constant 5x2

UNIT-IV

Q.8 Write short notes on the followings:
a) ADO        b) RDO        c) SQL 5x3

Q.9 Explain all the features available in a data report. 15
Q.1 Multiple choice questions:

a) Which one is the most important feature of spiral model?
   i) Quality management
   ii) Performance management
   iii) Risk management
   iv) Efficiency management

b) Process of generating analysis and design documents is called:
   i) Inverse engineering
   ii) Reverse engineering
   iii) Software engineering
   iv) Re-engineering

c) Function point team was coined by:
   i) Alan Albrecht
   ii) Berry Bohem
   iii) M. Halstead
   iv) Roger Pressman

d) In token count metrics the tokens are represented as:
   i) Operators
   ii) Operands
   iii) Both i) and ii)
   iv) None of the above

e) Coupling is a measure of:
   i) Relative functional strength
   ii) Interdependence among modules
   iii) Both i) and ii)
   iv) None of the above

f) The most desirable form of Cohesion is:
   i) Logical Cohesion
   ii) Procedural Cohesion
   iii) Functional Cohesion
   iv) Temporal Cohesion

g) A decision table has:
   i) Four partitions
   ii) Six partitions
   iii) Eight partitions
   iv) Two partitions

h) Test suit is:
   i) Set of inputs
   ii) Set of outputs
   iii) Set of test cases
   iv) All of the above

i) Data flow testing is related to:
   i) Data flow diagram
   ii) ER diagram
   iii) Data dictionaries
   iv) None of the above

j) SRS stands for:
   i) Software requirement specifications
   ii) Software requirement solution.
   iii) System requirement specifications.
   iv) None of the above.

UNIT-I

Q.2 Defined software and software engineering. What are the various principles of software engineering? Discuss them in detail.  

Q.3 Discuss water-fall model with the help of a neat diagram. What are the various documents produced at the end of each phase of this model? Describe the significance of these documents.
UNIT-II

Q.4 Define software metrics as per IEEE. Differentiate between product and process metrics. What metrics are used to measure the complexity of source code? Discuss them with the help of a suitable example.

Q.5 Write short notes on the followings:
   a) PERT and CPM   ii) WBS   iii) Gantt Chart

UNIT-III

Q.6 a) Elaborate the general design process with the help of a diagram.

b) Define module cohesion and explain different types of cohesion with suitable examples. What problems are likely to arise if a module has low cohesion?

Q.7 a) What is software reliability? What characteristics of software make software reliability different from hardware reliability?

b) Explain the concept of object oriented approach of design in software engineering with an example.

UNIT-IV

Q.8 Explain the structure and levels of SEI-CNM quality model. Compare and contrast it with ISO-9000 standard.

Q.9 What is Robust-testing? How this testing is an extension of boundary value analysis? Justify your answer with a suitable example.
End Semester Examination, May 2015  
MCA - Third Semester  
COMPUTER GRAPHICS AND MULTIMEDIA (MCA-304)

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 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

**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.

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.

UNIT-IV

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.
Q.1 Multiple choice questions:
   a) The 4-variable k-map has _______ rows and _________ columns.
      i) 2, 2  ii) 4, 4  iii) 4, 2  iv) 2, 4
   b) The addressing mode, where you directly specify the operand value is ______.
      i) Immediate  ii) Direct  iii) Definite  iv) Relative
   c) ______ is a single address spare for storing both memory and I/O device.
      i) Isolated I/O  ii) Memory mapped I/O  iii) Both i) and ii)  iv) None of these
   d) Which technique is used that identifies the highest priority resource by means of software?
      i) Daisy chaining  ii) Polling  iii) Priority  iv) Chaining
   e) An address in main memory is called:
      i) Physical address  ii) Logical address  iii) Memory address  iv) Word address
   f) Techniques that automatically move programs and data blocks into the physical memory when they are required for execution is called:
      i) Associative mapping  ii) Main memory  iii) Virtual memory  iv) Cache memory
   g) The main aim of virtual memory organization is:
      i) to provide effective memory access  ii) to provide better memory transfer  iii) to improve the execution of the program  iv) All of the above
   h) MIMD stands for:
      i) Multiple instruction multiple data  ii) Multiple instruction memory data  iii) Memory instruction multiple data  iv) Multiple information memory data
   i) The DMA transfer is initiated by:
      i) Processor  ii) The process being executed  iii) I/O devices  iv) Operating System
   j) The effectiveness of the cache memory is based on the property of __________.
      i) Locality of reference  ii) Memory localization  iii) Memory size  iv) None of the above

**UNIT-I**

Q.2 a) Explain the characteristics of RISC and CISC.  
   b) What is the difference between direct and indirect address instruction? How many references to memory are needed for each types of instruction to bring an operand into the process register?
Q.3 Divide 25 by 4 and also check for divide overflow condition.

UNIT-II

Q.4 What are the various types of asynchronous data transfer? Explain.

Q.5 a) What is the purpose of priority interrupt? Explain.
b) Explain the working of DMA controller with the help of a block diagram.

UNIT-III

Q.6 What is a cache memory? What are the various types of mapping procedure? Also explain writing into cache.

Q.7 Write short notes on:
a) Virtual memory
b) Associative memory

UNIT-IV

Q.8 Explain Flynn’s classification of computers. Describe four segment instruction pipeline with an example.

Q.9 a) What are the various types of pipeline processors?
b) Explain interleaved memory organization.
End Semester Examination, May 2015  
MCA - Third Semester  
WEB APPLICATION AND E-COMMERCE (MCA-302)

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  
a) The tag used in HTML to include external style sheet is:
   i) <ext>  
   ii) <link>  
   iii) <include>  
   iv) <a>  

b) Which CSS property controls text size?
   i) Text-style  
   ii) Text-size  
   iii) Font-size  
   iv) Font-style  

c) PHP scripts are executed on:
   i) ISP computer  
   ii) Client computer  
   iii) Server computer  
   iv) It depends on PHP scripts  

d) Which attribute is used to name an element uniquely?
   i) Class  
   ii) id  
   iii) Dot  
   iv) All of the above  

e) Which of the following HTML code is valid?
   i) <Font color= "red">  
   ii) <Color font= "red">  
   iii) <red> <font>  
   iv) All of the above  

f) Mechanism to protect private networks from outside attack is:
   i) Firewall.  
   ii) Antivirus.  
   iii) Formatting.  
   iv) Digital signature.  

g) What must you know in order to get to a website?
   i) Its URL  
   ii) Its Header  
   iii) Its title  
   iv) None of the above  

h) In PHP each statement must end with:
   i) . (dot)  
   ii) ; (Semicolon)  
   iii) / (Slash)  
   iv) : (Colon)  

i) Which of the following in not a predefined variable?
   i) $ get  
   ii) $ ask  
   iii) $ request  
   iv) $ point  

j) A table can be created without specifying primary key.
   i) True  
   ii) False  

UNIT-I

Q.2  
Write short notes on the followings:
   a) Inline style  
   b) Link tag  
   c) Scripting language

Q.3  
a) Define the role of class and identifier in CSS.  
b) Write a program to swap image using mouse over event.

UNIT-II

Q.4  
a) Explain echo and print function using suitable examples.
b) How are comments made in PHP? Explain all possible methods. Discuss the relevance of comments.  

Q.5  
  a) Explain different types of loops available in PHP with examples.  
  b) Explain functions in PHP with an example.  

UNIT-III  

Q.6 Define PHP class and object. Differentiate between the two. Write a program to demonstrate the usage of object and functions.  

Q.7  
  a) Explain constructor. How do we use a constructor? Can we have more than one constructor in a class? Give an example.  
  b) What is $ this variable? How is it used?  

UNIT-IV  

Q.8  
  a) Write a short note on use and show command in MySQL.  
  b) Give differences between MySQL and Oracle.  

Q.9 What is JOIN? How do we perform JOIN in MySQL? What are the different types of JOIN? Give examples of all types of JOIN.
Q.1 Fill in the blanks:
   a) The other name given to the operating system is _________ manager.
   b) A program in execution is called a _________.
   c) Interval between the time of submission and completion of the job is called _________.
   d) Long term schedulers are also called _________.
   e) Virtual memory is implemented by _________.

State True or False:
   f) A sector is a small physical storage unit on a disk.
   g) All devices can be controlled by a single device controller.
   h) Logical and physical addresses are same.
   i) Wait for graph is used for deadlock avoidance.
   j) System calls and system programs are same.

Q.2 Give an abstract view of an operating system? Enumerate important characteristics of a good operating system and also discuss how operating system acts as a resource manager.

Q.3 Differentiate between the following:
   a) Hard real time and soft real time
   b) Batch operating system and Time-sharing operating system.
   c) Multiprogramming and multitasking operating system.

Q.4 Draw a Gantt chart for the CPU schedule under FCFS and SJF algorithms for the following ready queue:

<table>
<thead>
<tr>
<th>Processes</th>
<th>P₁</th>
<th>P₂</th>
<th>P₃</th>
<th>P₄</th>
<th>P₅</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU Bursts</td>
<td>12</td>
<td>3</td>
<td>11</td>
<td>6</td>
<td>9</td>
</tr>
</tbody>
</table>

Also compute average turn around time and average waiting time.

Q.5 a) What are the four necessary conditions of a deadlock prevention?
   b) What is race condition? Explain how a critical section avoids this condition.
   c) What is a dispatcher? Explain its functions.

Q.6 What is a page fault? When do page faults occur? Describe the actions taken by the operating system when the page fault occurs. Explain with a suitable example.
Q.7 For the reference string: 7, 2, 0, 3, 3, 6, 3, 6, 7, 0, 2, 3, show FIFO, LRU and LIFO page replacement algorithms. What are the number of page faults?  

UNIT-IV

Q.8 What do you understand by file system? What are the different file access methods? What is the difference between absolute and relative path name of a file?  

Q.9 a) Prepare a SCANDISK schedule for the following sequence of sectors: 34, 98, 354, 2 and 7. Assume that current location of the head is at sector 15.  

b) Explain seek latency, Rotational latency and transfer latency in detail.
Q.1 a) Find the value of coefficient of correlation if regression coefficients are 0.2 and 0.8.
b) In a single throw of 2 distinct dice, what is the probability of getting total of 11.
c) The set \((-1,1)\) is multiplicative abelian group of order 2. (True / False)
d) Find the rank of matrix:
\[
A = \begin{bmatrix}
1 & 3 & 4 & 2 \\
2 & 4 & 6 & 2 \\
-1 & 5 & 4 & 6
\end{bmatrix}
\]
e) Find the Eigen values of the matrix:
\[
A = \begin{bmatrix}
6 & -2 & 2 \\
-2 & 3 & -1 \\
2 & -1 & 3
\end{bmatrix}
\]
f) Ten persons among whom A and B, sit down at random at a round table. Find the probability that there are 3 persons between A and B.
g) Explain the simplex method for solving a linear programming problem.
h) How many methods are there to find the initial basic feasible solution of a transportation problem? Name all of them.
i) Define vector space over field.
j) Prove that \((A^+)^\dagger = (A^+)^\dagger\). 

UNIT-I

Q.2 a) Discuss the consistency of the system of equation.
\[
\begin{align*}
2x - 3y + 6z - 5w &= 3 \\
y - 4z + w &= 1 \\
4x - 5y + 8x - 9w &= \lambda
\end{align*}
\]
for various values of \(\lambda\), if consistent, find solution.
b) Show that the following set of vectors in \(V_3\) is linearly dependent:
\{(1,0,1),(1,1,0),(1,-1,1),(1,2,-3)\}

Q.3 a) Show that:
\[
S = \begin{bmatrix}
1 & 2 \\
1 & -2
\end{bmatrix}
\begin{bmatrix}
0 & -1 \\
0 & 2
\end{bmatrix}
\begin{bmatrix}
0 & 0 \\
3 & 1
\end{bmatrix}
\begin{bmatrix}
0 & 0
\end{bmatrix}
\]
is a basis for \(M_{22}\).
b) Let \(V\) and \(W\) be vector space over \(F\). Then prove that \(T: V \to W\) is a linear transformation, if and only if:
\[
T(\lambda_1V_1 + \lambda_2V_2) = \lambda_1T(V_1) + \lambda_2T(V_2),
\]
Where \(\lambda_1, \lambda_2 \in F\) and \(V_1, V_2 \in V\)
UNIT-II

Q.4 a) Find the Eigen values and the corresponding Eigen vectors of the matrix:

\[
A = \begin{bmatrix}
8 & -6 & 2 \\
-6 & 7 & -4 \\
2 & -4 & 3
\end{bmatrix}
\]

b) Show that the following matrix is orthogeneral:

\[
P = \begin{bmatrix}
\cos \theta & 0 & \sin \theta \\
0 & 1 & 0 \\
-\sin \theta & 0 & \cos \theta
\end{bmatrix}
\]

UNIT-III

Q.5 a) Verify the Caylay Hamilton theorem for the matrix:

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

and hence find \( A^{-1} \). Also evaluate the matrix equation.

b) Triangularize the matrix:

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

UNIT-IV

Q.8 a) Solve the following unbalanced transportation problem:

\[
\begin{array}{cccccc}
&D_1 & D_2 & D_3 & D_4 & \text{Supply} \\
O_1 & 20 & 21 & 16 & 18 & 10 \\
O_2 & 17 & 28 & 14 & 16 & 9 \\
O_3 & 29 & 23 & 19 & 20 & 7 \\
\text{Demand} & 6 & 10 & 4 & 5
\end{array}
\]
Does there exist an alternative solution?  

b) Using Graphical method, solve the LPP:  
Max $Z = 5x_1 + 3x_2$  
Subject to the constraint  
$3x_1 + 5x_2 \leq 15$  
$5x_1 + 2x_2 \leq 10$  
and $x_1, x_2 \geq 0$  

Q.9  
a) Determine an initial basic feasible solution to the following transportation problem using:  
i) Least lost method.  
ii) Vogel’s approximation method.  
\[
\begin{array}{cccccc}
D_1 & D_2 & D_3 & D_4 & \text{Supply} \\
S_1 & 1 & 2 & 1 & 4 & 30 \\
S_2 & 3 & 3 & 2 & 1 & 50 \\
S_3 & 4 & 2 & 5 & 9 & 20 \\
\text{Demand} & 20 & 40 & 30 & 10 \\
\end{array}
\]

b) Determine the basic solution to the following LPP:  
Maximize:  
$u = x + 3y + 3z$  
Subject to the constraint:  
$x + 2y + 3z = 4$  
$2x + 3y + 5z = 7$  
and $x, y, z \geq 0$  
Also point out the degenerate basic feasible solution and optimal basic feasible solution.
End Semester Examination, May 2015  
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) What is the minimum numbers of two input NAND gates used to perform the function of two input OR gate?  
   i) One     ii) Two     iii) Three     iv) Four

b) 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 iii)

c) Which table shows the logical state of a digital circuit output for every possible combination of logical states in the inputs?  
   i) Function table     ii) Truth table     iii) Routing table     iv) ASCII table.

d) A flip-flop circuit can be used for:  
   i) Counting     ii) Scaling     iii) Rectification     iv) Demodulation

e) A comparison between serial and parallel adder reveals that serial order:  
   i) is slower.  
   ii) is faster.  
   iii) operates at the same speed as parallel adder.  
   iv) is more complicated.

f) Which of the following is not a common word length?  
   i) 32     ii) 8     iii) 16     iv) 12

g) ________ connects to an external device to the system buss:  
   i) I/O module     ii) DMA     iii) ALU     iv) Control unit

h) A computer memory has 64 K, 32-bit words, then the data bus will be ________ wide and the address bus will be ________ wide.  
   i) 16 bits, 16 bits     ii) 16 bits, 32 bits     iii) 32 bits, 32 bits     iv) 32 bits, 16 bits

i) The time required for a gate or inverter to change its state, is called:  
   i) Rise time     ii) Delay time     iii) Propagation time     iv) Charging time

j) In a JK flip-flop the function \( k = J' \) is used to realize:  
   i) T flip-flop     ii) S-R flip-flop     iii) D flip-flop     iv) M/S JK flip-flop

3\( \frac{1}{2}\)x10

UNIT-I

Q.2 a) Why NAND and NOR gates are universal gates? Simulate NAND and NOR to all basic gates?  

b) What are error detection code? Design a parity generator and parity checker circuit for an odd parity scheme.
Q.3 a) Convert the following expression to the other canonical form: \( F(A, B, C, D) = \Sigma(0, 1, 4, 5, 7, 9, 11) \).

b) A majority function is generated in a combinational circuit when the output is equal to 1 if the input variable have more 1’s than 0’s. The output is 0 otherwise. Design a three input majority function.

UNIT-II

Q.4 Design a 4-bit by 3 bit array multiplier.

Q.5 Explain the switching mode operation of P-N junction.

UNIT-III

Q.6 Design a four bit bidirectional shift register with a parallel load.

Q.7 What is race around condition in JK flip-flop? How does it arise? Explain master slave flip-flop.

UNIT-IV

Q.8 Differentiate between:
   a) I/O and memory bus.
   b) Isolated I/O and memory mapped I/O.

Q.9 Write short notes on:
   a) Hardwired Vs microprogrammed control unit.
   b) Types of interrupt.
End Semester Examination, May 2015  
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) Define a circular relation.  
b) Let S={a, b, s}. Draw the Hasse diagram of P(S).  
c) Simplify the logical statement:  
\[ \sim(\sim p \land q) \land (p \lor q) \]  
d) Use a Karnaugh map to find a minimal sum-of-products form for:  
\[ E = xy'z + xy + x'yz' + x'yzt \]  
e) What is dipole? Explain with an example.  
f) Find the complement of the graph:

![Graph](image)

g) Find the Parenthesized form of the Postfix form:  
\[ ABC**CDE+/\]  
h) Define finite state machines.  
i) Is the language \( L=\{a^n b^n, n=1, 2, \ldots\} \) over \{a, b\} context free? (Y/N)  
j) Show that the tree \( T_1 \) and \( T_2 \), shown in the figure below is isomorphic:

![Trees](image)

**UNIT-I**

Q.2  
a) Prove that the unit interval \( I=\{x:0 \leq x \leq 1\}=\{0, 1\} \) of real numbers is uncountable.  
b) How many people among 200000 people are born at the same time (hour, minutes, second)?  
c) Solve the recurrence relation \( d_n=2d_{n-1}-d_{n-2} \) with initial condition \( d_1=1.5 \) and \( d_2=3 \).

Q.3  
a) Let \( A=\{1, 2, 3, 4, 5, 6\} \). Define a relation \( R \) on \( A \) as follows:  
\( XRY \) if \( x \) divides \( Y \)  
Draw the Hasse diagram of the Poset \( (A, R) \).  
b) Is the following argument valid?  
If two sides of a triangle are equal,  
then the opposite angles are equal.  
Two sides of a triangle are not equal.  
\( \therefore \) The opposite angles are not equal.  
c) Find the total solution of the difference equation: \( a_n-a_{n-1}=4 \)
**UNIT-II**

Q.4  
a) Prove that if H is a subgroup of a group G, then the identity element of G is also the identity element of H.  
b) Prove that the direct product of any two distributive lattice is a distributive lattice.

Q.5  
a) Draw the circuit diagram of $= ab' + a'b$.  
b) Consider the function whose truth table is $T(E)=10101011$. Find Boolean expression using Karnaugh map.

**UNIT-III**

Q.6  
a) Apply Dijkstra algorithm to find the shortest path from s to t in the graph given below:

![Graph](image)

b) Find a Cut-Set for the graph given below:

![Graph](image)

Q.7  
a) Use Kruskal's algorithm to find a Spanning for the graph G given below:

![Graph](image)

b) Evaluate the postfix form: $21 - 342 ÷ + ×$

c) Represent the expression $(A+B)*(C-D)$ as binary tree and write the result of post order search for that tree.
UNIT-IV

Q.8  a) Design a finite state automaton that accepts those strings over \{0, 1\}, such that the number of zeros is divisible by 3.  

b) Show that the language \(L=\{a^mb^m: m \text{ is +ve}\}\) is not regular.

Q.9  a) Draw a transition diagram of NDFSA
\[ M'=(\{a, b\}, \{S_0, S_1, S_2\}, \{S_0\}, S_0, f), \]
where \(f\) is given by:

<table>
<thead>
<tr>
<th>S</th>
<th>I</th>
<th>f</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>a</td>
<td>S_0 {S_1, S_2}</td>
</tr>
<tr>
<td>S_0</td>
<td>b</td>
<td>S_0 {S_0, S_1}</td>
</tr>
<tr>
<td>S_1</td>
<td></td>
<td>{S_0}</td>
</tr>
<tr>
<td>S_2</td>
<td></td>
<td>\Phi</td>
</tr>
</tbody>
</table>

Also find equivalent DFSA.

b) Design a finite state automaton which accepts the set of all strings 0’s and 1’s and containing exactly three 1’s.