Q.1 Multiple choice / shorts answer questions:
   a) Add, Subtract, Multiply and Logic operations are performed by:
      i) Memory  ii) Control Unit   iii) ALU   iv) None
   b) MS Office is an application software.              (True/False)
   c) Special effects used to introduce slides in a presentation are called transitions (True/False)
   d) Total No. of pins in a traditional parallel port are:
      i) 5    ii) 14      iii) 25    iv) 27
   e) Which web browser is developed by Google?
      i) I.E.      ii) Firefox   iii) Safari    iv) Chrome
   f) Which one is volatile memory in a computer system?
      i) Hard Disc. ii) RAM      iii) ROM    iv) Optical Drive.
   g) _____________ bytes = 1 nibble.
   h) _____________ and ____________ are major forms of IP.
   i) Name 2 web based tools for E-commerce.
   j) ___________ and __________ are two modes of data transmission.  2X10

Q.2 Write short notes on the following:
   a) ESS.
   b) Knowledge Engineering.
   c) Data and Date Processing.
   d) Knowledge management.

Q.3 The hardware alone can’t perform any particular calculation or manipulation without being instructed exactly. What are these instructions known as and define and give their classification too.

Q.4 Various kinds of transmission medium are required for the purpose of transferring the data categories the types of transmission media and explain with the help of example.

Q.5 Below are the common types of E-commerce. Which of the following ‘u be very common in future? Explain in detail:

Q.6 Differentiate between data and data management system. What are the various types of database systems?

Q.7 What are the social and ethical issues related to information system?
End Semester Examination, Dec. 2018
B. Sc. (Information Technology) - First Semester
THE INFORMATION TECHNOLOGY SYSTEM (7.101)

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

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

Q.1 a) Name the components of a system unit.
       b) Differentiate between RAM and ROM.
       c) Name any three ports.
       d) What is a system software?
       e) What is a troubleshooting?
       f) What is a cloud computing?
       g) Differentiate between virus and worm.
       h) Why do we use MS-EXCEL?
       i) How AVERAGE is calculated in MS-EXCEL?
       j) What is the software requirement for MS-PowerPoint?  1½x10

PART-A

Q.2 a) Explain the history of computer with an example.  8
       b) Define and explain the components of a system unit.  7

Q.3 Define the internet. Explain different internet technologies in detail with suitable examples.  15

Q.4 What is a computer software? Differentiate system and application software. What are the types of system and application software available in the market?  15

PART-B

Q.5 a) What are the features of MS-OFFICE? How it helps in routine life?  7
       b) What is the purpose of Mail Merge? Write the steps involved in Mail Merge for a letter.  8

Q.6 What is mobile computing? What are different devices for mobile computing? What are the limitation and benefits of the same?  15

Q.7 Write short note on:
       a) IF, Nested If, COUNT, COUNTIF, COUNTIFS.
       b) Goal seek.
       c) Database and relational database.  5x3
Q.1 Answer the following multiple choice questions:

a) Encoding is the process in which:
   i) The sender writes down the message in morse code.
   ii) The sender converts the ideas into a message.
   iii) The receiver writes the message in brief.

b) You are working on three projects simultaneously. You are hard pressed for time. In a meeting for project 1, you are unable to concentrate because of:
   i) Unintentional communication.
   ii) Amount of communication.
   iii) Preoccupation.

c) "The communication path is circuitous". In this context, the word “circuitous” means:
   i) Begins and ends on the sender.
   ii) Circumstantial demands.
   iii) Message and import of message.

d) Mahesh is facing a major personal crisis. He is mental disturbed and is not very sure whether he will be able to communicate effectively with his team leader. In a situation such as this, he should:
   i) Do meditation.
   ii) Ask his friend to replace him.
   iii) Share his problems with his friends.
   iv) Check and recheck with the sender to ensure that his understanding is correct.

e) In empathetic communication, we can:
   i) Probe.
   ii) Respond to the feelings.
   iii) Interpret.
   iv) Advise.

f) A 55 year old executive, Malini concentrates only on making her presentation aesthetic and appealing to the audience. However, almost all her presentations are miserable failures. Little does she realize that the reason for her unimpressive presentations, as reported by the participants, is because of?
   i) Excessive concentration on form.
   ii) Unwillingness to study the requirements of the audience.
   iii) Her age.

g) Anurag wants to project that he is at ease in his presentation. He should:
   i) Be casual with platform behavior.
   ii) Be rigid in the centre of the well.
   iii) Smile and maintain eye-contact.
   iv) None of the above.

h) Smeeta wants to present enthusiasm in her speech. She should:
   i) Be low pitched.
   ii) Be high pitched.
   iii) Use a flat tone.
iv) None of the above.
   i) Coordinating with your peers reveals you in a positive light.
      i) True.
      ii) False.
   j) Vikram Sethi, MD of PSU, has found that all employees listen to his presentation even when he rolls up his sleeve and sits on the table. His ability to garner attention is because of his:
      i) Audio Management.
      ii) Knowledge.
      iii) Excellent PPTs.
      iv) None of the above.

**PART-A**

Q.2  a) “Communication is an interdisciplinary subject”. Argue against or in favor with evidence.  
     10  
   b) What is the impact of using too much or too little information in one’s communication?  
     10  

Q.3  a) How does the use of concrete words make communication more effective? Explain with an example.  
     10  
   b) Elaborate on the 7C’s and 4S’s of communication.  
     10  

Q.4  a) Good listening results in development of a comprehensive approach and open vistas to new ideas and newer avenues”. Elaborate.  
     10  
   b) Write short notes on *(any two)* of the following:
      i) Different types of listening.
      ii) Role of persuasion skills.
      iii) Effective negotiation skills.  
     5×2  

**PART-B**

Q.5  a) Write a letter to the Dean FCA, to thank him for the professional events being organized in the department with valid reasons.  
     10  
   b) Write a report on the Swachh Bharat Internship which you had undergone during summer break which is to be printed in daily newspaper.  
     10  

Q.6  a) Why is it important to ensure that voice modulations are in sync with the message communicated through body sport?  
     10  
   b) “A style of walk is a reflection of the mental state of an individual”. Elaborate.  
     10  

Q.7  a) “Internet has become the best mode to communicate”. Elaborate.  
     10  
   b) How visual effects can have a better impact on masses?  
     10
End Semester Examination, Dec. 2018
B.Sc. (Information Technology) – First Semester
BUSINESS COMMUNICATION (7.102)

Time: 3 hrs. Max Marks: 50
No. of pages: 1

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

Q.1 Provide a suitable word:
   a) The process by which the receiver confirms the message and comprehends the intent of the sender is called _______?
   b) The best form of listening is a combination of _______ and _______ listening.
   c) Too many voice inflections can _______ the audience.
   d) _______ and _______ are the stepping stones of projection of assertiveness.
   e) Volleying back and forth of ideas without listening to the ideas of other members of the team can make the discussion _______.
   f) _______ is normally a preliminary process of selection of candidates checking their leadership qualities, analytical skills, conviction flexibility.
   g) Flash drives and pen drives are examples of _______.
   h) Full form of www is _______.
   i) Clarity of purpose and specificity of message lead to concreteness in communication. (TRUE/FALSE)
   j) An assertive person knows how to shoulder both blame and praise. (TRUE/FALSE)  

1×10

PART-A

Q.2 a) How can you check your information for completeness? 5
   b) “Without feedback communication is incomplete”. Discuss. 5

Q.3 a) How does one make one’s communication more receivers centric? 6
   b) Mention the 7 C’s in communication. 4

Q.4 What strategies will you adopt to project an assertive stand? Discuss by giving examples at each level. 10

PART-B

Q.5 a) What are the different ways to carry out written communication? 6
   b) What is the importance of conducting a meeting? 4

Q.6 a) “Nonverbal communication is as important as verbal communication”. Explain. 6
   b) What is the role of nonverbal communication? 4

Q.7 a) What do you mean by visual communication? What are its advantages? 5
   b) How is internet acting as a boon and a bane for the young generations? 5
Q.1 Answer the following multiple choice questions:

a) Encoding is the process in which:
   i) The sender writes down the message in morse code.
   ii) The sender converts the ideas into a message.
   iii) The receiver writes the message in brief.

b) You are working on three projects simultaneously. You are hard pressed for time. In a meeting for project 1, you are unable to concentrate because of:
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f) A 55 year old executive, Malini concentrates only on making her presentation aesthetic and appealing to the audience. However, almost all her presentations are miserable failures. Little does she realize that the reason for her unimpressive presentations, as reported by the participants, is because of?
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  iii) Excellent PPTs.
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**PART-A**

Q.2  
 a) “Communication is an interdisciplinary subject”. Argue against or in favor with evidence.  
 b) What is the impact of using too much or too little information in one's communication? 

Q.3  
 a) How does the use of concrete words make communication more effective? Explain with an example.  
 b) Elaborate on the 7C’s and 4S’s of communication.

Q.4  
 a) Good listening results in development of a comprehensive approach and open vistas to new ideas and newer avenues”. Elaborate.  
 b) Write short notes on any two of the following:  
   i) Different types of listening.
   ii) Role of persuasion skills.
   iii) Effective negotiation skills.

**PART-B**

Q.5  
 a) Write a letter to the Dean FCA, to thank him for the professional events being organized in the department with valid reasons.  
 b) Write a report on the Swachh Bharat Internship which you had undergone during summer break which is to be printed in daily newspaper.

Q.6  
 a) Why is it important to ensure that voice modulations are in sync with the message communicated through body sport?  
 b) “A style of walk is a reflection of the mental state of an individual”. Elaborate.

Q.7  
 a) “Internet has become the best mode to communicate”. Elaborate  
 b) How visual effects can have a better impact on masses?
Q.1 a) Define the terms: logical error, syntax error and runtime error.
b) Why main function is necessary in computer programming?
c) What are an identifiers and a keyword in any programming language?
d) What is the structure of a C# program? Give an example.
e) What is the difference between pseudo code and flow chart?
f) Differentiate between compilation and execution of a program.
g) Write the syntax of five string functions of C#.
h) Write the syntax for do while loop in C#.
i) What is data validation in C#?
j) Define recursive procedures in C#.

Q.2 a) Why does the object-oriented philosophy need functions to be defined inside the classes? What could be the advantage? Write any C# program that you have written earlier to support your answer?
b) What is software crisis? Is the software development life cycle necessary for software development? Support your answer with the help of suitable example.

Q.3 a) Draw a flowchart to find all the roots of a quadratic equation $ax^2 + bx + c = 0$.
b) Write an algorithm to check whether a number entered by user is prime or not.

Q.4 a) Why does C# allow an *implicit* conversion from long to float. Give suitable example to support your answer?
b) "Invoking event handlers in C# has always been a bit of pain." Justify the statement with the help of an example.

Q.5 a) Write a program to find the sum of first 50 prime numbers using while loop and do while loop? Also compare the output.
b) What is difference between passing by value and passing by reference using C#?

Q.6 Define an array. Give syntax to declare an array. Write all possible types of an array. Write a program to calculate average marks obtained by class of 30 students? Also sort them in ascending order?

Q.7 Write short notes on:
a) Error handling in C#.
b) Recursive procedures in C#.
Q.1 Multiple choice questions:
a) The data model which describes how the data is actually stored is:
   i) Internal physical model
   ii) External model.
   iii) Logical model.
   iv) None of these. 1
b) DFD stands for __________.
   i) Data flow document.
   ii) Data file diagram.
   iii) Data flow diagram.
   iv) None of the above. 1
c) __________ defines the structure of a relation which consists of a fined set of attribute domain pairs.
   i) Instance.
   ii) Program.
   iii) Schema.
   iv) Super-key. 1
d) A relational database developer refer to a records as:
   i) An attribute.
   ii) A temple.
   iii) A criteria.
   iv) A relation. 1
e) __________ keyword is used to find the number of values in a column.
   i) TOTAL.
   ii) ADD.
   iii) COUNT.
   iv) SUM. 1

Answer the following questions:
f) Draw and write names of symbols used in ER diagrams.
g) Differentiate between candidate key and superkey.
h) Differentiate between SQLDCL and SQLDDL.
i) Differentiate between DELETE and DROP.
j) Give two Codd’s rules. 2x5

PART-A

Q.2 a) Why would you choose a database system instead of simply storing data in operating system files? When would it make sense “not to use” a database system? 8
b) Why logical independence and physical independence is required? Why mapping is required? 7

Q.3 Ram Kishor wants to store information (names, addresses, description of embarrassing moments etc.) about many ducks on his payroll. The volume of data compels him to buy a database system. To save money, he wants to buy one with the fewest possible features, and he plans to run it as a stand alone application on his PC alone. Also, he does not plan to share his list with anyone. Indicate which of the following DBMS features Ram Kishos should pay for; in each case indicates why Ram Kishore should pay for that feature:
a) A security facility.
b) Concurrency control.
c) Crash recovery.
d) A view mechanism.
e) A query language. 3x5
Q.4 Sports department have to maintain a database for National Cricket League (NCL) and following are the requirements:
   a) NCL has many teams.
   b) Each team has a name, a city, a coach, a captain and set of players.
   c) Each player belongs to one team and has a name, a position, a skill level and a set of injury records.
   d) A game is played between two teams and has a date and a score.
   e) A team captain is also a player. Construct a clean and concise ER diagram for NCL DB with cardinalities.

P A R T - B

Q.5 Differentiate between the following concepts with examples:
   a) DDL V/S DML V/S DCL.
   b) Primary key V/S candidate key V/S super key.
   c) Group By V/S HAVING V/S WHERE

Q.6 Give SQL queries for the schema student (student ID, name, address, gender, Date of Birth, city):
   a) List all the students with all the description; sorted by names in decending order.
   b) List all students from same city.
   c) Count all the female students.
   d) Remove all the records whose date of birth is before 1987.
   e) Insert three more records in the database.

Q.7 Write short notes on the following:
   a) Union.
   b) Intersection.
   c) Cartesian product.
   d) Business intelligence.
   e) Joins.
Q.1  a) What is BCNF?  
b) Name two relational database.  
c) What is data dictionary?  
d) Draw all the symbols used in ER diagram.  
e) Define ‘three data types in SQL’.  
f) DML stands for ________.  
g) Define ‘triggers’.

**PART-A**

Q.2  In an organization several projects are undertaken. Each project can employ one or more employees. Each project is undertaken on the request of client. A client can request for several projects. Each project has only one client. A project can use a number of items and an item may be used by several projects. Draw an E-R diagram and convert it to a relational schema.

Q.3  a) Define codd’s rules with suitable example.  
b) Explain three tier database architecture with the help of suitable example.

Q.4  a) What is the role of database administrator? What are his/her functions and responsibilities?  
b) Differentiate between file oriented system and database system. Give examples.

**PART-B**

Q.5  a) Differentiate between DDL, DML and DCL.  
b) Differentiate between having, group by and where clause used in SQL. Give syntax too.

Q.6  a) What are the various characteristics of SQL? Discuss and give syntax of five aggregate functions with a suitable example.  
b) What is union compatibility? Why do the union, intersection and difference operations require that the relations on which they are applied be union compatible?

Q.7  Write short notes on:  
a) Business intelligence characteristics and benefits.  
b) Stored procedures and triggers.
Q.1 Fill in the blanks:
   a) __________ layer lies between the network layer and the session layer and the
       session layer:
   b) Communication between a computer and a keyboard involves _________
       transmission.
   c) Decryption and encryption of data are the responsibility of the _________
       layer.
   d) Address of __________ class starts with 123.0.0.0
   e) Write subnet mask of following address 172.16.32.11 ____________.

**PART-A**

Q.2 List out the types of data communication. What are the fundamental characteristics on
which he effectiveness of data communication depends on?  

Q.3 Write down atleast five differences between LAN, WAN and MAN on the basis of
configuration, data rate, transmission media, topologies and number of users.  

Q.4 How do layers of the TCP/IP protocol suite correlate to the layers of OSI model?
Discuss.  

**PART-B**

Q.5 What do you understand by congestion control? Explain token bucket and leaky bucket
algorithm with example.  

Q.6 What is meant by wireless LAN technology? Discuss its operation on physical layer.  

Q.7 Explain classful and classless addressing with example of each class.  

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End Semester Examination, Dec. 2018  
B. Sc. (Information Technology) — Second Semester  
FUNDAMENTALS OF COMPUTER NETWORKING (7.105A)

Time: 3 hrs.  Max Marks: 40  
No. of pages: 1

Note: Attempt **FIVE** questions in all; **Q.1 is compulsory.** Attempt any **TWO** questions from
**PART-A** and **TWO** questions from **PART-B.** Marks are indicated against each question.
Q.1 Fill in the blanks:
   a) TCP stands for _______.
   b) The OSI model consists of _______ layers.
   c) FTP protocol stands for _______.
   d) Network topology is part of _______ layer.
   e) In data communication, ATM is an acronym for _______.

   **PART-A**

Q.2 a) Differentiate LAN, MAN, WAN in terms of communication technology, speed, topology and area coverage. 
   5
   b) Differentiate TCP/IP and OSI model. 
   5

Q.3 What is congestion control? Explain any two congestion control schemes in detail.  
   10

Q.4 Explain the following in brief:
   a) Switches. 
   b) Routes. 
   c) Gateway. 
   d) Hub. 
   2½×4

   **PART-B**

Q.5 In context with TCP/IP protocol, explain:
   a) ICPM 
   b) UDP 
   c) SMTP 
   d) SNMP 
   2½×4

Q.6 Explain the utilities that are helpful in identifying and repairing network performance problems.  
   10

Q.7 a) Describe the goals an ideal password authentication scheme should achieve. 
   5
   b) What are the features of a digital signature and how digital signature provides security? 
   5
End Semester Examination, Dec. 2018  
B. Sc. (Information Technology) – First Semester 
FUNDAMENTAL OF COMPUTER NETWORKING (7.105)

Time: 3 hrs. Max Marks: 100  
No. of pages: 1

Note: Attempt FIVE questions in all; **Q.1 is compulsory**. Attempt any TWO questions from **Part-A** and TWO questions from **Part-B**. Marks are indicated against each question.

Q.1 a) TCP/IP stands for ___________.
b) IEEE defines specification for wireless LAN which covers physical and data link layer is ___________.
c) Name of different transmission media are ___________.
d) DNS stands for ___________.
e) Topology refers ___________ structure of a network.
f) Data flow between two devices can occur in:
   i) Simplex ii) Half duplex
   iii) Full duplex iv) All of the above

g) Transmission media lies below the follow layer:
   i) Application ii) Transport
   iii) Network iv) Physical

h) How gateway is different from Router?
i) Define ‘switches and routers’.
j) Data communication system within a building or campus is:
   i) LAN ii) WAN
   iii) MAN iv) None of the mentioned.  

PART-A

Q.2 a) Explain the different layers of OSI with the help of suitable diagram. 10
b) How does switched network work? Explain various switching networks with the help of example. 10

Q.3 Explain the following:
   a) Network and its type.
   b) IPv4 and IPv6 addressing.
   c) Host name and DNS server.
   d) 802:11 WLANs.
   e) Transmission media. 4x5

Q.4 a) Discuss in detail the working of DNA server. 10
b) Compare the working of hub, switch and router in network. 10

PART-B

Q.5 How does a VLAN reduces network traffic? Also list various advantages of VLANs. 20

Q.6 What do you understand by cryptography? Explain different types of cryptography with the help of suitable example. 20

Q.7 a) Explain the role of firewall in terms of system security. 10
b) What is a VPN and why it is required? 10
Q.1 Give one line definition:
   a) Startup.  
   b) Demand.  
   c) CSR.  
   d) Goods.  
   e) Services.  

   \[2 \times 5\]

**PART-A**

Q.2 Explain the PEST (Political Economics, Social and Technological) factors of India for business.  
\[10\]

Q.3 Write short notes on:
   a) Corporation.  
   b) Not for profit organization.  
\[5 \times 2\]

Q.4 Compare the features of task external environment and mega external environment.  
\[10\]

**PART-B**

Q.5 “Law and order must be prevailing in any country/region. It is a mandatory condition for business to operate and grow.” Justify above statement.  
\[10\]

Q.6 Explain the concept of demand and supply. Give examples of Indian economy to support your statement.  
\[10\]

Q.7 What is international trade? What are the components of international trade?  
\[10\]
Q.1 Answer the following questions:
   a) Write down all the subsets of:
      i) \[ \left\{ \frac{1}{2}, 1, \pi \right\} \]
      ii) \( \{a, b, c, d\} \)
   b) What are equivalent sets?
   c) Prove that \( A - (B \cap C) = (A - B) \cup (A - C) \)
   d) State the following pairs of set is disjoint \( \{a, e, I, o, u\} \) and \( \{c, d, e, f\} \)
   e) Define degree of a linear equation.
   f) What is a diagonal matrix?
   g) Determine the domain of \( R = \left\{ \left( x, \frac{1}{x} \right) : 0 < x < 6, x \in N \right\} \)
   h) Define central tendency in statistics.

PART-A

Q.2 a) If \( U = \{2, 3, 4, 5, 6, 7, 8, 9, 10, 11\} \), \( A = \{2, 4, 7\} \), \( B = \{3, 5, 7, 9, 11\} \), and \( C = \{7, 8, 9, 10, 11\} \).
   i) \( (A \cap U) \cap (B \cup C) \).
   ii) \( C - B \).
   iii) \( (B - C) \).
   iv) \( (B - C)' \).
   b) Find the power set of \( \{a, b, c\} \).
   c) Write down all the subsets of the following sets:
      i) \( \{a\} \) ii) \( \{a, b\} \) iii) \( \{1, 2, 3\} \) iv) \( \{\phi\} \)

Q.3 a) If \( f(x) = 2x + 1 \), find the range if domain is \( \{-1, 2, 3\} \) and hence find the function.
   b) If \( f(x) = x^5 - \frac{1}{x^7} \), find the value of \( f(x) + f\left(\frac{1}{x}\right) \).

Q.4 a) Solve the following equations:
   i) \( x^2 - 6x + 8 = 0 \)
   ii) \( x^2 - 4x - 12\sqrt{x^2 - 4x + 19} + 51 = 0 \).
   b) Simplify \( \frac{\sqrt{x^p \cdot x^q \cdot q\sqrt{x^m}}}{q\cdot x^{m+1} \cdot x^m} \).

PART-B

Q.5 Find the inverse of the matrix:
\[
\begin{bmatrix}
1 & 2 & -2 \\
-1 & 3 & 0 \\
0 & -2 & 1
\end{bmatrix}
\text{ and verify that } AA^{-1} = A^{-1}A = I.
\]

Q.6  A ball is drawn at random from a box containing 7 black balls, 6 green balls and 4 blue balls. Determine the probability that it is:
   i) Black. ii) Green. iii) Blue.
   iv) Not Black. v) Black & green.

Q.7  a) The frequency table of the monthly salaries of 20 people is shown below:

<table>
<thead>
<tr>
<th>Salary (In dollar)</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>3500</td>
<td>5</td>
</tr>
<tr>
<td>4000</td>
<td>8</td>
</tr>
<tr>
<td>4200</td>
<td>5</td>
</tr>
<tr>
<td>4300</td>
<td>2</td>
</tr>
</tbody>
</table>

   i) Calculate the mean of the salaries of the 20 people.
   ii) Calculate the standard deviation of the salaries of the 20 people.

b) Explain and write the formula of mean mode and median.
End Semester Examination, Dec. 2018
B. Sc. (Information Technology) – Third Semester
SYSTEM ANALYSIS AND DESIGN (7.201 / 7.201A)

Time: 3 hrs. Max Marks: 40
No. of pages: 1

Note: Attempt **FIVE** questions in all; **Q.1 is compulsory.** Attempt any **TWO** questions from **Part A** and **TWO** questions from **Part B.** Marks are indicated against each question.

Q.1 State whether the following statements are **TRUE or FALSE:**
   a) DFDs are not used for design and for analysis only.
   b) An on-line system is always a real time system.
   c) A feasibility study is required in system planning.
   d) Abstract systems are conceptual they are not physical entities.
   e) Documentation is not at all a factor for a successful system.
   f) A working model of a system is prototype.
   g) An information system is a closed system.
   h) Programming is testing the software for quality.

**PART-A**

Q.2 a) What is the difference between physical DFD and digital DFD?
   b) Differentiate unit testing and integration testing.
   c) Explain the role of system analyst.

Q.3 a) What is structured analysis? Briefly review the tools used.
   b) What considerations are involved in feasibility analysis? Which consideration do you think is the most crucial? Why?

Q.4 What is system development life cycle? Explain all the phases of SDLC in detail. How does it relate to system analysis?

**PART-B**

Q.5 Explain about the following:
   i) Data Structure.
   b) Data Dictionary.

Q.6 a) What are real time systems and on-line systems? Explain.
   b) Explain any two methods of fact gathering.

Q.7 Differentiate between open and closed system. What are the different types of a system testing?
Q.1 Answer the following:
   a) Name three static and three dynamic testing techniques:
   b) Can we start testing at the stage of SRS?
   c) Evaluate the benefits of verification in a project.
   d) V and V diagram is the basis for every type of testing. Comment on this statement. \[2 \times 4\]

**PART-A**

Q.2 What are the various principles of testing? Also, explain in detail, what should we test? And who should do the testing? \[8\]

Q.3 a) Why does software fail after it has passed from acceptance testing? \[5\]
    b) Differentiate between verification and validation. \[3\]

Q.4 a) How can you relate quality assurance and quality control to the process and product of any project? \[5\]
    b) Describe the test case suite. \[3\]

**PART-B**

Q.5 How many product quality factors are defined in McCall software quality model and why? \[8\]

Q.6 Explain how CMM encourage continuous improvement of software process. \[8\]

Q.7 What should be the role of test manager in improving testing process. \[8\]
Q.1 Attempt the following:
   a) A break in the working of a system is called:
      i) Defect  ii) Fault  iii) Failure  iv) Error
   b) Testing the software is:
      i) Verification  ii) Validation  iii) Both  iv) None
   c) Testing of software with actual data and actual environment is called:
      i) Alpha testing  ii) Beta testing  iii) Regression testing  iv) None
   d) _________ is a more formal process:
      i) Walkthrough  ii) Inspection  iii) Reviews  iv) None
   e) Customer satisfaction and risk management are _________ goals of software testing.
      i) Long term  ii) Short term  iii) Post-implementation  iv) All of above
   f) In V model of testing, the scope of verification from top to bottom:
      i) Increases  ii) Decreases  iii) Remains the same  iv) None of the above.
   g) _________ service is needed in order to deliver the core service.
      i) Updating  ii) Enhancing  iii) Enriching  iv) Enabling
   h) Usage rights of an IT service is provisioned by which process:
      i) Incident management  ii) Request fulfillment  iii) Access management  iv) Change management

PART-A

Q.2 a) Testing is the process of executing a program with the intent of finding errors. Comment on this statement.
   b) How does testing help in producing quality software?

Q.3 a) There are too many possible paths through the progress to test. How can one calculate and ensure that all possible paths has been executed and tested with sufficient test cases?
   b) Why does software testing needs extensive planning?

Q.4 A program reads three numbers A, B, C within the range [1, 50] and prints the largest number. Design test cases for this program using boundary value robust testing methods.
**PART-B**

Q.5  
   a) If a client was being difficult and refused to provide you with needed information.  
       How would you handle this situation?  
   b) How does corporate governance address the problem of integrating business and  
       information technology?  

Q.6  
   How can one provide IT service delivery support? What parameters are affecting the  
       process?  

Q.7  
   How do you classify information security risk across an organization?
End Semester Examination, Dec. 2018
B. Sc. (Information Technology) – Third Semester
COMPUTER ALGORITHM AND DISCRETE MATHEMATICS (7.203)

Time: 3 hrs.  Max Marks: 40
No. of pages: 1

Note: Attempt FIVE questions in all; Q.1 is compulsory. Attempt any TWO questions from Part-A and TWO questions from Part-B. Marks are indicated against each question.

Q.1 Fill in the blanks:
a) Linked List overcomes the limitations of ____________.
b) Tree traversals methods are ____________, __________, __________.
c) ____________ tree can be used as an index.
d) ____________ data structure can be used to perform recursion.
e) What is recurrence relation?
f) Explain the concept of four planar graph problems.
g) Differentiate between data type and data structure.
h) In how many ways tree can be traversed?

PART-A

Q.2 Discuss in detail the major threats to any data or information for which it needs cryptography?  

Q.3 Differentiate between algorithm and Flowchart. Write algorithm to insert an element into an array.  

Q.4 How recursion can be used to solve the problem of linear search?  

PART-B

Q.5 Two dice are rolled, find the probability that the sum is:
a) Equal to 1  
b) Equal to 4  
c) Less than 13  

Q.6 Construct a tree using:
In-order E A C K F H D B G
Preorder F A E K C D H G B

Q.7 What do you mean by Linked List? How it overcome the disadvantage of array? How can insertion be done in the beginning of linked list?
End Semester Examination, Dec. 2018  
B.Sc. (Information Technology) — Third Semester  
COMPUTER ALGORITHMS AND DISCRETE MATHEMATICS  
(7.203A)

Time: 3 hrs.  Max Marks: 60

Note: Attempt FIVE questions in all; Q.1 is compulsory. Attempt any TWO questions from PART-A and TWO questions from PART-B. Marks are indicated against each question.

Q.1 Answer the following question:
   a) Given three sets A, B and C. show that \( (A \cap B) \cup C = (A \cap C) \cap (B \cup C) \).
   b) Determine the domain and range of following function:
      “A function that assigns to each positive integer in last digit”.
   c) How many seven letter words can be formed using the letters of the word “BENZENE”.
   d) Write an equivalent formula for \( (P \cup q) \cap (P \cup R) \) which is free from conditional operator.
   e) Give an example of a Hamiltonian graph.
   f) Draw a complete graph \( K_5 \).

PART-A

Q.2 a) If A and B are sets, prove that:
    \( A \cap B = (A - B) \cup B \).
   b) Given a set \( A = \{1,2,3,4\} \). Define a relation R “a is less than b”. Find \( R^{-1} \).

Q.3 Find the solution of following recurrence relations:
   a) \( a_r = a_{r-1} + 7 \).
   b) \( a_r - 5a_{r-1} + 6a_{r-2} = 2, \quad a_0 = 1 \quad and \quad a_1 = -1 \).

Q.4 Show using truth table:
   a) \( P \land Q \lor (P \land \neg Q) \lor (\neg P \land Q) \).
   b) Discuss any three valid rules of inference with the help of suitable example.

PART-B

Q.5 Five boys and five girls are to be seated together. In how many ways can they be seated if?
   a) All boys must be seated in five leftmost seats.
   b) No two boys can be seated together.
   c) Three boys and two girls sit in a row.

Q.6 Consider the graph shown below:

Find:
   a) All cycles.
   b) All cut points, if any.
   c) All bridges, if any.
   d) The degree of each vertex.
e) All paths from a to g.
f) Diam (G), the diameter of G.

Q.7 Draw different possible non-isomorphic binary trees with three vertices. In how many ways a binary tree can be traversed. Discuss in detail.
Q.1 Write short notes on the following:
   a) Parameterized constructors.
   b) Virtual function.
   c) Friend function

**PART-A**

Q.2 a) Explain the characteristics of object oriented programming approach.  
   b) What are the advantages of object oriented programming over procedural programming?

Q.3 Explain the relationship among classes with suitable examples.

Q.4 What is the difference between call by value and call by reference? Write a program to implement the same.

**PART-B**

Q.5 Write a program to declare a class "student" consisting of data members stu_rollno and st_name. Write the member functions accept ( ) to accept and display ( ) to display the data for five students.

Q.6 a) Write a program in C++ to implement the concept of multilevel inheritance.
   b) Write a program to compute the area of a triangle and a circle by overloading the method area ( ).

Q.7 a) When do we need multiple catch blocks for a single try block? Give an example.
   b) Write a program to handle divide by zero exception handling.
Q.1 a) **Answer the following questions:**
   i) What is the range of data type short in java?
   ii) Give syntax of a method of string buffer class.
   iii) Can we override a constructor?
   iv) Define “Local applet”.
   v) What is an abstract class?
   vi) What are final variables?
   vii) What is JVM?
   viii) Differentiate super and this keyword.
   ix) Discuss one main need of a package in Java.
   x) Define “Wrapper classes”.
   xi) What is Java AWT?  

b) **Fill in the blanks:**
   i) Modulus operator can be applied to ________ operands.
   ii) ________ is not a part of exception handling.

b) **State whether the following statements are (TRUE OR FALSE)**
   i) Public access specifier can be used for an interface.
   ii) Byte code is machine dependent.

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**PART-A**

Q.2 a) How the object oriented paradigm is different from structural programming? Also discuss the benefits and applications of OOP.  

b) “Can we override a constructor”? Comment on it.

Q.3 Explain in detail with examples all looping controls available in Java.

Q.4 a) Write a program to implement multiple inheritance using interfaces. Also explain the process.

b) How do you define a class in Java? Explain through an example.

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**PART-B**

Q.5 a) Define “Applet”. How is an applet different from an application? Describe the life cycle of an applet.

b) What is layout manager? Explain any one in detail.

Q.6 Write a Java program using AWT to print “Welcome to Manav Rachna” in red colour. When we click on a button the text colour should change it randomly.

Q.7 Define “Exception in Java”. How it is different from an error? What are the various techniques to handle exceptions in Java? Explain with example.
Q.1 Answer the following multiple choice questions:
a) Type casting in VB .NET is implemented by means of ________ statement.
   i) Type ( ). ii) Type Def ( ).
   iii) B types ( ). iv) C types ( ).
b) The method that need to be invoked on the data adapter to load the generated dataset with data is:
   i) Bind ( ). ii) Fill ( ).
   iii) Fill Data ( ). iv) Set Data ( ).
c) How many types are stored by “Long Data Type” in .Net?
   i) 8 ii) 4
   iii) 2 iv) 1
d) Default type of number without decimal is:
   i) Long int. ii) Unsigned long.
   iii) Int. iv) Unsigned int.
e) To use the .Net framework data provider for SQL server, an application must reference the ________ namespace.
   iii) System.Data.SQL. iv) None of the above.
f) Which of the following is not a aggregate function:
   i) Avg ii) Sum
   iii) With iv) Min
g) The ________ keyword is used to access attributes of preceding tables or sub queries in the from clause.
   i) In. ii) Lateral.
   iii) Having. iv) With.
h) Which of the following keyword is used to change data and behavior of a base class by replacing a member of the base class with a new derived member?
   i) Overloads. ii) Overrides.
   iii) New. iv) Base.
i) Which command type value is incorrect?
   i) Stored procedure. ii) Table direct.
   iii) Text. iv) Table schema.
j) What are the command object methods?
   i) Execute non query. ii) Execute reader.
   iii) Excute scalar. iv) All of the above.

PART-A

Q.2 a) Describe the detailed architecture of .Net framework with the help of suitable example. 7
b) Explain the difference between variable and constant. 4
c) Describe the term MSIL in detail in context to .Net. 4
Q.3  a) Database connectivity with any programming language plays a very important role in the software development. Explain your answer with the help of suitable example.  
   b) Explain the difference between radio button and check box with the help of a small program.  

Q.4  a) Compare the following:  
   i) List Box and combo box.  
   ii) Check box and checklist box.  
   iii) Label and textbox.  
   b) Describe the different data design tools in context to ADO .NET in detail.  

PART-B  

Q.5  a) Describe the difference between dataset view and data grid view with the help of suitable example.  
   b) Explain the different data access layers applicable for windows application.  
   c) Describe the utility of report handling in .NET with the help of suitable example.  

Q.6  a) Describe the different object oriented concept with all the required features in context to .Net.  
   b) Explain the different DML statement to be used in ADO .Net in context to application programming.  

Q.7  Differentiate between the following:  
   a) WPF and XML.  
   b) Binding source and Binding navigator.  
   c) Object linking and Object linking and Embedding.  

5×3
Q.1 a) What is difference between vulnerability and exposure? Provide five differences.
b) What is difference between law and ethics?  

Q.2 What is a honeypot? How it is different from honeynet?  

Q.3 Make a list of five categories of threats that MRIIRS network may be facing. Explain each of them with example.  

Q.4 Computer forensics are increasingly an area which are in demand when we need evidence for computer crime around world. So many billions of dollars are stolen due to vulnerability in computer system. IDPS is one of the software used to prevent such attacks. Explain how this program is to prevent these attacks?  

Q.5 What is network footprinting? What is network fingerprinting? How they are related?  

Q.6 Classify each of following occurrences as an incident or disaster. If an occurrence is a disaster whether or not business continuity plans would be called into play.
   a) A hacker gets into network and deletes all files from server.  
   b) A fire breaks out in the storeroom and set off sprinklers to flour. Some computers are damaged. But fires is contained before it moves out of area.  
   c) Employees go on strike and company would be without critical workers for weeks.  
   d) A disgruntled employee takes a central server home sneaking it out after hours.  

Q.7 What are types of password attacks? What can a system administrator do to protect against them?
End Semester Examination, Dec. 2018  
B. Sc. (Information Technology) – Second Semester  
DATABASE ENGINEERING-II (7.214)

Time: 3 hrs.  
Max Marks: 40
No. of pages: 1

Note: Attempt **FIVE** questions in all; **Q.1 is compulsory.** Attempt any **TWO** questions from **Part-A** and **TWO** questions from **Part-B.** Marks are indicated against each question.

Q.1 Explain the following with example:
   a) Primary key.
   b) Foreign key.
   c) Unique key.
   d) Super key.  

**PART-A**

Q.2 What do you mean by joins? Explain all types of joins with suitable example.  

Q.3 What are SQL constrains, how do we define it during the creation of table? Explain various types of constraints with example.  

Q.4 Explain the following:
   a) E.F. Codd Rules of RDBMS.
   b) Discuss any five SQL functions with example.  

**PART-B**

Q.5 What do you mean by concurrency, what types of problems occur during concurrency and explain shared and exclusive locks with example?  

Q.6 What do you mean by PL/SQL? How is it different from SQL and also explain its architecture?  

Q.7 Explain all the control structures in PL/SQL with example.
Q.1  a) The primary key is selected from the:
   i) composite keys.  ii) determinants.
   iii) candidate keys. iv) foreign keys.

   b) Drop Table cannot be used to drop a table referenced by a ________ constraint.
   i) Local Key  ii) Primary Key
   iii) Composite Key  iv) Foreign Key

   c) __________ first proposed the process of normalization in DBMS.
   i) Edgar. W  ii) Edgar F. Codd
   iii) Edward Stephen  iv) Edward Codd

   d) A functional dependency is a relationship between or among:
   i) tables  ii) rows
   iii) relations  iv) attributes

   e) If attributes A and B determine attribute C, then it is also true that:
   i) A \rightarrow C   ii) B \rightarrow C
   iii) (A,B) is a composite determinant. iv) C is a determinant.

   f) Abbreviate ACID.
   i) Atomicity, Consistency, Isolation, Durability.
   ii) Atomicity, Concurrency, Isolation, Duplicity.
   iii) Aggregation, Consistency, Isolation, Durability.
   iv) Atomicity, Consistency, Identity, Durability.

Q.2 Explain the Three level architecture of a DBMS with suitable diagram. What are the advantages and disadvantages of a DBMS?

Q.3 a) What are the characteristics of Data warehouse? Explain the Data Warehouse Architecture.

   b) A university registrar’s office maintains data about the following entities:
   i) courses, including number, title, credits, syllabus, and prerequisites;
   ii) course offerings, including course number, year, semester, section number, instructor(s), timings, and classroom;
   iii) students, including student-id, name, and program; and (iv) instructors, including identification number, name, department, and title. Further, the enrollment of students in courses and grades awarded to students in each course they are enrolled for must be appropriately modeled. Construct an E-R diagram for the registrar's office. Document all assumptions that you make about the mapping constraints.

Q.4 Consider the following relational schema:
Emp (eid: integer, ename: string, age: integer, sal: real)
Dept (did: integer, dname:string, mgrid: integer)
Write SQL statement to
i) Create the 'Works' relation including appropriate versions of all primary and foreign key integrity constraints.
ii) Give every employee of did = '6' and 10% raise in salary.
iii) Add 'John' as an employee with eid = '99', age = '30', and salary = '15,000'.
iv) Delete the 'Research' department and explain what happens when this statement is executed.

b) Explain Inner and outer join in SQL with the help of examples.

**PART-B**

Q.5  
a) What three types of anomalies can be exhibited by a database, and what are the problems caused by them. Explain with suitable example. 6  
b) Consider a relation R= (A,B,C,D,E) with the following functional dependencies:  
\{CE→D, D→B, C→A\}  
CE is the key.  
i) Identify the best normal form that R satisfies (INF, 2NF, 3NF, or BCNF).  
ii) If the relation is not in BCNF, decompose it until it becomes BCNF. At each step, identify a new relation, decompose and re-compute the keys and the normal forms they satisfy. 6

Q.6  
a) Explain the concept of distributed database? What are the components of distributed databases? 6  
b) What are the risks associated with database security? Explain with suitable example. 6

Q.7  
a) Explain transaction states using state transition diagram. 6  
b) Explain the timestamp based protocol for concurrency control in DBMS. 6
Q.1 Discuss the following:
   a) Stakeholder.
   b) Business Analyst.
   c) Business use case.
   d) Iterative Development.

PART-A

Q.2 Discuss the Waterfall and Prototype methodology and compare its advantages and disadvantages. Provide 2 advantages and disadvantages for each system development methodologies.

Q.3 Discuss the elements inside the Venn diagram:

PART-B

Q.4 What are the differences between requirements model and a specification model? Justify your answer.

Q.5 Identify at least five non-functional and five functional requirements from the scenario below:

Jun's Special Ice Cream wants to speed up the ordering process, reduce losses caused by misunderstandings on the phone and attract new customers. A new web based ice cream ordering system that allows customers to enter orders in their web browsers is supposed to solve all three issues.

The ordering system must be easy to use, as customers of all ages and expertise levels are supposed to use it. Customers may order ice cream with three different flavours, such as Vanilla, Mango and Chocolate Mocha. Customers must be able to register for a customer account. A customer account stores address information and preferences, but no payment details for security reasons. The system must be usable with all major web browsers (i.e. Internet explorer, Firefox, Safari and Opera) and be able to handle
at least 15 customers ordering at the same time. The system may be enhanced later to provide promotions of specific ice cream's on special days or events. The retail assistant can specify all available flavours. She can request a list of all open orders. When he has finished preparing the order, she marks an order as 'ready for delivery'. A delivery note with the customer's address, to be attached to the ice cream by the retail assistant, is printed automatically.

Q.6 Discuss the three business strategies available for business analysts in today's changing environments. Focus on their uses and the interactions of the user.

Q.7 Make a use case scenario in depositing money in a bank in India for normal case transaction. Limit your transaction to 9 or 10 steps. Identify the primary actors (give three) and the pre-conditions (give two).
Q.1 a) Program Preemption is ______________.
b) ______________ is used to organize files.
c) What is job scheduler?
d) What is physical address?
e) Fragmentation is ______________.
f) Fork system cal is used for ______________.
g) What is turn around time?
h) What are semaphores?

PART-A

Q.2 a) On which criteria CPU scheduling can be used? Explain them. 4
b) How inter-process communication is achieved by cooperating processes? 4

Q.3 What are the necessary conditions that the process should satisfy to prevent it from entering critical section problem? How to solve it with use of semaphores? 8

Q.4 What are the different services provided by the operating system? Explain with example. 8

PART-B

Q.5 Consider following reference string:
2, 3, 4, 5, 2, 7, 1, 3, 4, 5, 2, 1, 3
Assume there are three memory frames. Solve it using FIFO and LRU and optimal gage replacement policy. Calculate the total no. of hit and miss using FIFO and LRU (least recently used) and optimal page replacement algorithm. 8

Q.6 How to prevent deadlock in operating systems? How it is different from deadlock avoidance and detection? 8

Q.7 Write short notes on:
a) File sharing and protection.  
b) Disk scheduling and management. 4×2
Q.1  a) What is the preferred way for adding a background color in HTML?
   i) <body background="yellow">
   ii) <background>yellow</background>
   iii) <body style="background-color:yellow">
   iv) <background color="yellow" text=background>

b) What is the correct HTML for creating a hyperlink?
   i) <a name="" A</a>
   ii) <a>B</a>
   iii) <a href="http://www.example.com">example</a>
   iv) <a url="http://www.example.com">example</a>

c) How can you create an e-mail link?
   i) <mail href="a@b">
   ii) <mail>a@b</mail>
   iii) <a href="a@b"/>
   iv) <a href="mailto:a@b.com">

d) How can you open a link in a new browser window?
   i) <a href="url” new>
   ii) <a href="url” target “new”>
   iii) <a href="url” target “blank”>
   iv) <a href="url” target="”>

e) Which of the following JavaScript cannot do?
   i) JavaScript can react to events
   ii) JavaScript can manipulate HTML elements
   iii) JavaScript can be use to validate data
   iv) All of the Above

f) Which is not a property of attribute Behaviour of <Marquee> tag?
   i) alternate
   ii) blur
   iii) scroll
   iv) slide

g) ________ keyword is used to declare variables in JavaScript.
   i) Var
   ii) Dim
   iii) String
   iv) None of the above

h) Which of the following options is correct with regard to HTML?
   i) It is a modeling language
   ii) It is a scripting language
   iii) It is a partial programming language
   iv) It is used to structure documents

i) How can you make a list that lists the items with numbers?
   i) <ul>
   ii) <list>
   iii) <ol>
   iv) <dl>

j) What is the correct HTML for making a checkbox?
   i) <checkbox>
   ii) <input type="checkbox"/>
   iii) <input type="check"/>
   iv) <check>

PART-A

Q.2  a) How do I link to a location in the middle of an HTML document?
b) Why do you need validation? Show the use of regular expression in JavaScript to validate the email address with example.

Q.3 a) Write a program in JavaScript to greet a user with welcome message when an HTML page completes loading. When a user leaves the page the goodbye alert dialog box should be displayed?

b) What are various types of dialog box available in JavaScript to interact with user?

Q.4 a) In how many ways can a CSS be integrated as a web page?

b) Write code in HTML to create following table:

<table>
<thead>
<tr>
<th>Quick</th>
<th>brown fox</th>
<th>jumps</th>
</tr>
</thead>
<tbody>
<tr>
<td>over the</td>
<td>lazy</td>
<td>dog</td>
</tr>
<tr>
<td></td>
<td>then</td>
<td>it</td>
</tr>
<tr>
<td></td>
<td></td>
<td>fall</td>
</tr>
<tr>
<td></td>
<td></td>
<td>prey</td>
</tr>
<tr>
<td></td>
<td></td>
<td>to</td>
</tr>
<tr>
<td></td>
<td></td>
<td>lion</td>
</tr>
</tbody>
</table>

Q.5 a) Which security you can apply to your web applications? Explain in detail.

b) “Separating data, business logic and presentation is a modern way managing web applications”. Do you agree? Justify.

Q.6 a) Explain how list box is inserted in ASP.net using different attributes

b) Explain 3-Tier Architectures in ASP.net.

Q.7 a) ASP.NET has a series of controls which can help us to validate the user input? Explain each of them in detail.

b) Differentiate grid view and form view control in ASP.net.
End Semester Examination, Dec. 2018  
BCA — Third Semester  
PRINCIPLES OF MANAGEMENT (BCA-001A-CB)  

Time: 3 hrs. Max Marks: 100  
No. of pages: 1  

Note: Attempt FIVE questions in all; Q.1 is compulsory. Attempt any TWO questions from PART-A and TWO questions from PART-B. Marks are indicated against each question.  

Q.1 Answer the following:  
a) Management is not a profession because managers cannot depend only on knowledge to succeed in their work. (True/False)  
b) What is the term used for the defining the number of subordinates directly controlled by a manager?  
i) Division management ii) Departmentation  
iii) Sphere of influence iv) Span of management.  
c) Which of the following is not the proper step of controlling?  
i) Taking corrective action. ii) Creating a structure.  
iii) Establishing the standards iv) Monitoring actual performance.  
d) Objectives may be general or __________.  
e) Organising in a general sense means __________ of activities.  
f) __________ refers to the managerial function of employing and developing HR.  
g) Delegation and decentralization are closely related.  
h) __________ is the practice of assessing employee job performance and condition under which employment is carried out.  
i) Motivation can be only monetary.  
j) Organizational climate is based on the __________ of members.  

PART-A  

Q.2 a) Discuss the managerial implications of informal organizations.  

Q.3 a) What is the concept of staffing? Describe the importance and need for proper staffing?  
b) In detail explain the importance of planning in the present Indian business environment. Also highlight the different types of plans.  

Q.4 a) What is the significance of decision making? What procedure should be followed in arriving at correct decision?  
b) Write a comparative note on the contributions of Taylor and Fayol.  

PART-B  

b) Differentiate the on the job training and off-the-job training.  

Q.6 a) Define motivation. Explain important characteristics of motivation and the motivational process.  
b) What are the leadership qualities that you would look for a manager?  

Q.7 a) Define the management function of control and explain the necessity for control.  
b) Explain in detail the important characteristics of an effective team.
End Semester Examination, Dec. 2018
BCA — Third Semester
PRINCIPLES OF MANAGEMENT (BCA-001A-CB)

Time: 3 hrs. Max Marks: 100
No. of pages: 1

Note: Attempt FIVE questions in all; Q.1 is compulsory. Attempt any TWO questions from PART-A and TWO questions from PART-B. Marks are indicated against each question.

Q.1 a) **Answer the following multiple choice questions:**
   i) Management as a system emphasis:
      i) Open system perspective.
      ii) Socio-technical system.
      iii) Close-technical system.
      iv) None of these. 2
   ii) Which one of the following is not a type of planning premises?
      i) External
      ii) Tangible.
      iii) Remedial.
      iv) Controllable. 2

b) **Fill in the blanks:**
   i) __________ level of management includes foremen and supervisor.
   ii) Fayol developed the __________.
   iii) Conflict can be seen as behavior included to __________ the achievement of some other person’s goals. 2×3

c) **State whether the following statement are TRUE OR FALSE:**
   i) Managers are needed only in business firms. 2
   ii) Management is not a profession because managers cannot depend only on knowledge to success in their work. 2×2

d) **Define the following in brief:**
   i) MBO.
   ii) Principles of organization.
   iii) Departmentation. 2×3

PART-A

Q.2 Give ten reasons to increase the effectiveness of manpower planning in the new era of globalization. 20

Q.3 Discuss the meaning, methods and importance of departmentalization. What basic factors would you keep in mind while creating departments in an enterprise? 20

Q.4 a) What is the significance of decision making? What procedure should be followed in arriving at correct decision? 10
   b) Critically evaluate contingency approach to management. 10

PART-B

Q.5 a) Explain in brief the various methods adopted for training the employees in an organization. 10
   b) What is job specification? How is it different from job description? 10

Q.6 a) What guidelines can the management set and follow the control process? 10
   b) Explain in detail all techniques of controlling. 10
Q.7  
a) “Good leadership is an integrated part of effective management”. Explain and illustrate. 10  
b) To what extent and how are money recognition and power an effective motivator. 10
Q.1  

a) **Answer the following multiple choice questions:**

i) In management process the most misinterpreted word is:
   a) Organizing.  
   b) Delegating.  
   c) Controlling.  
   d) Planning.  
   2

ii) The objective in corporate governance are:
   v) Growth.  
   vi) Stability.  
   vii) Shareholders value maximization.  
   viii) All of the above.  
   2

iii) A primary benefit of MBO is:
   a) Avoid competition.  
   b) Resistance against new entrance.  
   c) Improve employee motivation.  
   d) Increased resources.  
   2

iv) The process of management does not include:
   a) Planning.  
   b) Organizing.  
   c) Leading.  
   d) Commitment.  
   2

b) **Fill in the blanks:**

i) Management as a discipline is the function of __________.  

ii) The word __________ demolish a functions a task a discipline.  

2×2

c) **Answer the following questions:**

i) Explain in brief the various types of decisions.  

ii) Differentiate between manager and leader.  

iii) How centralization and decentralization are different? Explain in brief.  

iv) “Open systems dynamically interact with their environment”. Is this statement true or false.  

2×4

**PART-A**

Q.2  

a) How does management differ from administration? Give the importance of management decision making and describe its process.  

15

b) Explain “Job analysis”.  

5

Q.3  

a) What are the contributions of Henry Fayol in the area of scientific management? Explain in brief.  

10

b) Goal setting is the most important part of planning process. Explain in detail.  

10
Q.4  a) Explain the process of organizational design? Describe the matrix design of an organization.  
    b) Explain the difference between formal and informal organization.  

    **PART-B**

Q.5  a) What is staffing? Who is responsible for staffing? Why it is needed? Explain it.  
    b) Explain in brief the various sources of recruitment.  

Q.6  Write short notes on (any four) of the following:  
    a) Time management techniques.  
    b) Computer based MIS.  
    c) Delegation of Authorities.  
    d) Gantt chart.  
    e) Team building.  

Q.7  What do you understand by a leader? How it is different from a manager? Explain the skills and qualities of a good leader.
LEADERSHIP AND ORGANIZATIONAL BEHAVIOR (BCA-002CB)

Q.1 Write short notes on following:
   a) Leadership attributes.
   b) Role of a leader.
   c) Transformational theory.
   d) Self leadership.
   e) Democratic leader.
   f) Effects of conflict.
   g) Difference between manager and leader.
   h) Stress management.
   i) Distributive warning.
   j) Organizational behavior.

   2×10

PART-A

Q.2 a) Explain different type of leadership styles.  
     10
   b) What are the different factors that influence leadership behavior?  
     10

Q.3 a) What are the basic traits that a leader should have?  
     10
   b) Explain any three theories of leadership.  
     10

Q.4 a) Write short notes on following:
      i) Leadership purpose.
      ii) Crucibles of leadership.  
      5×2
   b) What is cohesiveness? How it can be increased among group?  
      10

PART-B

Q.5 a) Explain the frame work of organizational behavior.  
     10
   b) Explain the concept and objectives of organizational behavior.  
     10

Q.6 a) With the example explain one positive and one negative aspect of organizational behavior.  
     10
   b) What is perception management? How it impact the growth of organization? Discuss in detail.  
     10

Q.7 a) Explain the different factors involve in job satisfaction.  
     10
   b) How negative thinking can affect the organizational culture? Discuss in detail.  
     10
End Semester Examination, Dec. 2018
BCA – Third Semester
LEADERSHIP AND ORGANISATIONAL BEHAVIOUR (BCA-002A (CB))

Time: 3 hrs.  Max Marks: 100
No. of pages: 1

Note: Attempt FIVE questions in all; Q.1 is compulsory. Attempt any TWO questions from PART-A and TWO questions from PART-B. Marks are indicated against each question.

Q.1 a) List the importance of studying OB.
b) Explain the word 'Personality'.
c) What is emotional intelligence?
d) What is perception?
e) Define group dynamics.
f) Role of a leader.
g) Transformational leader.
h) Empowering leadership.
i) Conflict management.
j) Objectives of a leader. 2x10

PART-A

Q.2 a) How will you encourage your team by sharing the other team member's success? 10
b) What are the four different leadership styles and brief them? 10

Q.3 a) How great man approach is different from trait theory. 10
b) Explain following with the support of example:
   i) Effective leadership.
   ii) Behavioral theory. 5x2

Q.4 a) Why is it important for a leader to be in his/her ethical boundaries? How could it affect his/her leadership? 10
b) Write short notes on:
   i) Integrated leader.
   ii) Authentic self. 5x2

PART-B

Q.5 a) Give an example of at least one positive and at least one negative behavior in an organization. 10
b) Discuss the elements of motivation. How would you discuss the three key elements of motivation? 10

Q.6 a) What is the keyword in organization structure? Discuss. 10
b) How do group norms and statuses affect individual behavior? 10

Q.7 a) How can managers increase job satisfaction? How do you think managers increase job satisfaction? 10
b) "Positive self-esteem is significant to overcome the stress". Justify. 10
E-COMMERCE (BCA-004 CB)

Q.1 Answer the following multiple choice questions:
   a) What are the various components of electronic commerce applications?
   b) What is the importance of JIT delivery in B2B e-commerce?
   c) What are the characteristics of internet based EDI?
   d) What are the classifications of e-commerce field by the nature of the transactions?
   e) Why do the companies usually choose to implement SAP?
   f) What is the need of collaborative computing?
   g) What are the three different types of transitions and mobility within a wireless network?
   h) What do you mean by supply chain execution framework?
   i) What are the major methods used for advertisement?
   j) What do you mean by cryptography?

PART-A

Q.2 a) What do you understand by e-commerce? What is its role in current business scenario? How it is different from traditional business scenarios?
   b) E-commerce is not successful in the Pakistan do you agree? What are the reasons of failures in Pakistan and what is its future?

Q.3 a) What is the role of first virtual payment system in e-commerce history? What are the current payments modes used in e-commerce?
   b) The owner of Bhavishay medical store wants to update his business strategy into online business. Write the essentials concept to develop its company profile.

Q.4 Compare the following term with suitable example:
   a) Digital signature v/s Digital certificates.
   b) Stored valued cards v/s E-cash.
   c) Treats v/s Protection in e-commerce.
   d) Electronic fund transfer v/s Electronic check systems.

PART-B

   b) Explain about e-marketing. What is e-marketplace and explain different functions of e-marketplaces?

Q.6 a) What role does re-engineering work processes play in IT applications?
   b) What is the role of ERP in SCM? Explain features and capabilities of ERP?

Q.7 Write short notes on the following:
   a) Intermediaries and virtual communities.
   b) Global electronic commerce and impact on industry structure.
Q.1 Multiple choice questions:

a) Which of the following is not an effective software project management focus?
   i) people          ii) product
   iii) popularity    iv) process

b) Which of the following is not a project manager’s activity?
   i) project control ii) project management
   iii) project planning iv) project design

c) A software ________ provides the framework from which a comprehensive plan for software development can be established.
   i) people          ii) product
   iii) process       iv) None of these

d) Which of the following is a people-intensive activity?
   i) Problem solving.
   ii) Motivation.
   iii) Organization.
   iv) Project Management.
   v) None of the above.

e) Which of the following is not an effective project manager trait?
   i) Problem solving.
   ii) Managerial Identity.
   iii) Influence and Team building.
   iv) Non of the mentioned.

f) Commitments to unrealistic time and resource estimates may result in:
   i) project delay.
   ii) poor quality work.
   iii) project failure.
   iv) All of the mentioned.

g) The project planner examines the statement of scope and extracts all important software functions which is known as:
   i) Association          ii) Decomposition
   iii) Planning process   iv) All of the mentioned

h) The only deliverable work product for a successful project is the working program.
   i) True          ii) False

i) Which of the following categories is part of the output of software process?
   i) computer programs
   ii) documents that describe the computer programs
   iii) data
   iv) All of the mentioned

j) The best way to test the Software Project Management Plan (SPMP) is by:
   i) Prototyping
   ii) Inspection
   iii) Simulation
iv) Compilation.
v) Debugging.  

PART-A

Q.2 a) Explain the structured approach to project planning. Also discuss certain challenges found by the project manager.  
     b) List at least five challenges faced by the project manager.  

Q.3 a) Explain the following project management components:  
     i) Organize.
     ii) Plan.
     iii) Control.  
     b) Discuss the following terms:  
     i) Process.
     ii) Phases.
     iii) Knowledge area.  

Q.4 a) What do you understand by Risk Management? Discuss some ways in which risk analysis is performed by project manager.  
     b) Discuss any project plan that is technically oriented in terms of its: scope, time and cost.  

PART-B

Q.5 a) Explain the role of Simulation in making the project successful.  
     b) What is Gantt chart? How Gantt chart helps in project scheduling? Give a suitable example to support your answer.  

Q.6 a) What are the features of a good project report? How it contributes in successful completion of the project?  
     b) Give some methods of project auditing.  

Q.7 a) Explain Organization structure briefly.  
     b) Explain some situations that may lead to conflicts in an organization.  
     c) Give two methods of resolving conflicts in an organization.
End Semester Examination, Dec. 2018
BCA – First Semester
INTRODUCTION TO INFORMATION TECHNOLOGY AND PROGRAMMING
TECHNIQUE (BCA-101(CB))

Time: 3 hrs. Max Marks: 100
No. of pages: 2

Note: Attempt FIVE questions in all; Q.1 is compulsory. Attempt any TWO questions from PART-A and TWO questions from PART-B. Marks are indicated against each question.

Q.1 Answer the following:
   a) The processor which performs arithmetical and logical operations is called:
      i) Control ii) ALU iii) Register iv) Cache Memory
   b) Which was an early mainframe computer?
      i) UNIC ii) FUNTRIA iii) BRAINIA iv) ENIAC
   c) Which network protocol is used to send e-mail?
      i) FTP ii) SSH iii) POP3 iv) SMTP
   d) Operating system is the most common type of __________ software.
      i) Communication ii) Application iii) System iv) Word processing software
   e) The operating system manages:
      i) Memory ii) Processor iii) Disk and I/O devices iv) All of the above
   f) Which memory is non-volatile and may be written only once?
      i) RAM ii) EEPROM iii) EPROM iv) PROM
   g) Which of the following items is not used in local area networks (LANs)?
      i) Computers ii) Modem iii) Printer iv) Cable
   h) Computer virus is a ________.
      i) Hardware ii) Software iii) Bacteria iv) Freeware
   i) ________ is the high speed memory used in the computer.
      i) RAM ii) Hard disk iii) Cache iv) BIOS
   j) The device primarily used to provide hardcopy is the:
      i) CRT ii) Computer console iii) Printer iv) Card reader

PART-A

Q.2 a) Write the applications of computers in the field of sports and hospital. 10
    b) Classify the computers on the basis of following criteria.
       i) According to size.
       ii) According to nature. 10

Q.3 Solve the following:
   a) \((00110011)_{2} = \text{?}_{8}\)
   b) \((236.23)_{8} = \text{?}_{10}\)
   c) \((B_{D})_{16} = \text{?}_{8}\)
d) \((36_2)_8 = ?_{16}\)
e) \((54)_{16} = ?_8\)

Q.4 Differentiate between:
a) RAM and ROM.
b) PROM & EPROM.
c) Softcopy and Hardcopy.
d) Impact and non-impact printers.

**PART-B**

Q.5 Explain the following:
a) Types of error.
b) Programming strategies with advantages and disadvantages.
c) Selection.
d) Iteration.

Q.6 What do you mean by flowchart? Discuss all the symbols of flowchart and draw the flowchart of greatest of three numbers.

Q.7 a) What do you understand by program designing approach? Explain its relative advantages and disadvantages.
b) What is meant by program? Describe its characteristics.
Q.1  a) If the order of matrix A is \( mxp \) and order of matrix B is \( pxn \). Then order of matrix \( AB \) is _________.

b) What is \( \alpha \) if \( B = \begin{bmatrix} 1 & 4 \\ 2 & \alpha \end{bmatrix} \) is a singular matrix?

c) Find \( x \) such that \((17)^{3.5} \times (17)^x = 17^8\).

d) If \( \left( \frac{a}{b} \right)^{x-1} = \left( \frac{b}{a} \right)^{x-3} \); find \( x \).

e) Find the value of \( \log_2^{16} \).

f) There are 30 people in a group. If all shake hands with one another, how many handshakes are possible.

g) Find the total number of words formed by 2 vowels and 3 consonants laken from 4 vowels and 5 consonents.

h) Differentiate \( 32^3 + 3x^2 + 5x + 7 \) w.r.t \( x \).

i) Evaluate \( P(10,8) \).

j) If \( \cos A = \frac{1}{7} \) find \( \sin A \).

**PART-A**

Q.2  a) Simplify: \( \frac{9(4^x)^2}{16^{x+1} - 2^{x+1} \cdot 8^x} \)  

b) Evaluate \( \log \frac{41}{35} + \log 70 - \log \frac{41}{2} + 2\log 5 \)

Q.3  a) If \( A = \begin{bmatrix} 9 & 1 \\ 4 & 3 \end{bmatrix}, B = \begin{bmatrix} 1 & 5 \\ 7 & 12 \end{bmatrix} \), find the matrix \( x \) such that \( 3A + 5B + 2x = 0 \).

b) For which value of \( x \), will \( \begin{pmatrix} 2 & 1 & 0 \\ 1 & 0 & 2 \\ 0 & 2 & 4 \end{pmatrix} \begin{pmatrix} x \\ 4 \\ -1 \end{pmatrix} = 0 \).

Q.4  a) Write down the 7\(^{th} \) term in the expansion of \( \left( \frac{4x}{5} - \frac{5}{2x} \right)^9 \).

b) A father takes 8 children, three at a time to the zoo, as often as he can without taking the same three together more than once:

i) How often will child go?

ii) How often will he go.
Q.5 a) Prove that: \[ \frac{\sin 2\theta}{1 - \cos 2\theta} = \cot \theta. \]

b) Prove that \( \tan A + \cot A = 2 \cosec 2A. \)

Q.6 a) If \( y = \frac{1 - \sin x}{1 + \cos x} \), find \( \frac{dy}{dx} \).

b) Differentiate \( \sqrt{3x^2 - 7} \) w.r.t. \( x \).

Q.7 a) Discuss the continuity of function:

\[
 f(x) = \begin{cases} 
 \frac{x^2 - 4}{x - 2} & x < 2 \\
 4 & x = 2 \\
 2 & \text{for } x > 2 
\end{cases}
\]

at \( x = 2 \).

b) Expand \( \sin x \) and \( \cos x \) in power of \( x \) by Maclaurin’s theorem.
Q.1 Answer the following questions:
   a) If \( A = \{2, 3\}, B = \{x : x \text{ is a root of } x^2 + 5x + 6 = 0\} \) find \( A \cup B \).
   b) If \( G = \{7, 8\} \) and \( H = \{5, 4, 2\} \) find \( GXH \).
   c) If \( \tan x = \sqrt{3} \) find \( \sin x \).
   d) Find the derivative of the function \( f(x) = 2x^2 + 3x - 5 \).
   e) Evaluate \( \lim_{x \to 1} \frac{x^2 - 1}{x - 1} \).
   f) In a single throw of two dice, the probability of getting a total other than 9 or 11 is _______.
   g) Find \( \frac{dr}{dt} \) when \( r = (1 - \cos t)i + (t - \sin t)j \).
   h) Which term of A.P. 11, 17, 23, ... is 551.
   i) If \( f \) and \( g \) are the functions such that \( f : R \to R \) and \( g : R \to R \) \( f(x) = 4x - 1 \) and \( g(x) = x^2 + 2 \) find \( 'fog' \).
   j) Write down all the such-set of \( \{1, 3, 5\} \).

Q.2 a) In a class of 60 boys there are 45 boys who play cards and 30 boys who play carrom. Use set operations to show:
   i) How many play cards only.
   ii) How many boys play carrom only.

b) Let \( A = \{2, 3, 4\} \) and \( B = \{3, 6, 8\} \) find \( R \) where \( R \) is relation ‘\( x \) divides \( y \)’ from set \( A \) to set \( B \). Also, find \( R^{-1} \), Domain (\( R \)) and Range (\( R \)).

Q.3 a) Write the domain of the following function:
   i) \( y = \frac{x^2 - 9}{x - 3} \)
   ii) \( y = \frac{x^2 + 3x + 5}{x^2 - 5x + 4} \)

b) If \( f, g : R \to R \) are defined respectively by \( f(x) = x^2 + 3x + 1 \), \( g(x) = 2x - 3 \). Find:
   i) \( fog \)
   ii) \( gof \)
   iii) \( fof \)

Q.4 a) If \( A+B=45 \); prove that \( \cot A - 1)(\cot B - 1) = 2 \)

b) Prove that \( \cos 20^\circ \cos 40^\circ \cos 60^\circ \cos 80^\circ = \frac{1}{10} \).

Q.5 a) Two dice are tossed once. Find probability of getting an even number on first die or a total of 8.
b) A card is drawn from a deck of cards. Find probability of getting a king or a heart or a red card.

**UNIT-III**

Q.6  
\[ b) \text{Find the value of } a \text{ if the function } f \text{ is given by:} \]
\[ f(x) = \begin{cases} 
2x-1 & \text{, } x < 2 \\
 a & \text{, } x = 2 \text{ continuous at } x = 2 \\
 x+a & \text{, } x > 2 
\end{cases} \]
\[ b) \text{Differentiate } \left( \frac{3x+4}{2-x} \right)^2 \text{ w.r.t. } x. \]

Q.7  
\[ a) \text{If } y = x + \sqrt{x^2 - 1}, \text{ prove that } (y-x) \frac{dy}{dx} - y = 0. \]
\[ b) \text{Evaluate } \text{div } f \text{ where } f = 2x^2 i - xy^2 j + 3y^2 k \text{ at } (1, 1, 1). \]

**UNIT-IV**

Q.8  
\[ a) \text{Evaluate } \int \frac{x+1}{x^2 + 1} \, dx. \]
\[ b) \int \frac{x}{\sqrt{1+x}} \, dx. \]

Q.9  
\[ a) \text{Solve the differential equation:} \]
\[ (x+2) \frac{dy}{dx} = x^2 + 4x - 9 \]
\[ b) \text{Show that the set } I \text{ of all integers } \ldots (-4, -3, -2, -1, 0, 1, 2 \ldots) \text{ is an abelian group with respect to the operation of addition of integers.} \]
Q.1  a) Define square matrix:
   
b) Find transpose of \( A = \begin{bmatrix} 2 & 3 \\ 4 & 10 \end{bmatrix} \).

c) If \( A = \begin{bmatrix} 3 \\ -7 \\ 1 \end{bmatrix} \) and \( B = \begin{bmatrix} 4 & 2 \\ 8 & 6 \end{bmatrix} \) find \( (A-B) \).

d) Find \( |A| \) if \( A = \begin{bmatrix} 2 & -5 \\ 7 & 1 \end{bmatrix} \)

Q.2  a) Find \( A^{-1} \) where \( A = \begin{bmatrix} 1 & 1 & 3 \\ 1 & 3 & -3 \\ -2 & -4 & -4 \end{bmatrix} \)

Q.3  a) Simplify: \( \frac{2^{m+3} \times 3^{2m-n} \times 5^{m+n+3} \times 6^{n+1}}{6^{m+1} \times 10^{n+3} \times 15^n} \).

Q.4  a) How many different words can be made out of the letters in the word \( (ALLAHABAD)' \). In how many of these will the vowels occupy the even places.

   b) Find the coefficient of \( (x^6) \) in the expression of \( (x+2)^9 \).
Q.5  
a) Prove that: \[ \frac{\tan A}{1 - \cot A} + \frac{\cot A}{1 - \tan A} = \sec A \cdot \csc A + 1. \]  
b) Prove that \( \cos^2 30^\circ + \cos^2 45^\circ + \cos^2 60^\circ = \frac{3}{2} \).

Q.6  
a) Differentiate w.r.t. \( x \) \( \frac{(3x + 1)(2x + 2)}{(3x + 1)} \).

b) Evaluate \( \lim_{x \to 2} \frac{x^2 - 4}{x - 2} \).

Q.7  
a) Expand \( \log(1 - x) \) in powers of \( x \) by Maclaurin’s series.

b) If \( f(x) = 2x^2 - 4x + 10 \), find the value of \( f\left(\frac{8}{9}\right) \) with the help of Taylor’s series \( f(x + h) \).
Q.1 Answer the following:
   a) What is daisy-wheel?
   b) UART stands for ________.
   c) What is data-bus?
   d) L1, L2, L3 are from of __________ memory.
   e) A keyboard is also known as __________ computer.
   f) CMOS stands for __________.
   g) What is RS-232?
   h) MS DOS 1.0 operating system was launched in __________.
   i) AGP stands for __________.
   j) What is USB? 

Q.2
   a) What is difference between intel Pentium IV and Celeron processor? 
   b) What is DMP printer? Write the advantages and limitations of DMP printer. 

Q.3
   a) What is the role of keyboard controller?
   b) What do you mean by super-controller?
   c) State 10 unique features of intel i9 processor.

Q.4 Write short notes on the following:
   a) Cache memory.
   b) Errors of printers.
   c) Laser printer.
   d) Processor overlocking.

Q.5
   a) List five ways to detect and prevent viruses.
   b) Define industry standard architecture (ISA) and its importance.

Q.6
   a) Explain the POST process in detail.
   b) Explain the concept of north and south bridge.

Q.7
   a) Differentiate the working of data bus and control bus.
   b) Give USB architecture and explain its working.
   c) Describe PCI model and its working in detail.
Q.1 Define the following in brief:
   a) Motherboard.
   b) Parallel Port.
   c) Cache Memory.
   d) Hacking.
   e) Over-clocking.

**Fill in the blanks:**
   f) 1 TB = ___________ bytes.
   g) BIOS stands for ___________.
   h) ___________ is heart of computer.
   i) ISA stands for ___________.
   j) ___________ can store upto 700 MB of data.

**PART-A**

Q.2 a) “Intel i9 is the fastest and most advanced processor of current times”. Explain the unique features of Intel i9 processor.
   b) “The development in wireless technology has changed the way devices are connected. These days we can print the files directly from our mobile devices on a printer”. Explain the steps to connect a wireless printer to your mobile and laptop through Wi-Fi.

Q.3 Write the short notes on the following:
   a) Super Controller.
   b) Keyboard Controller.
   c) Difference between mini and micro-computer.
   d) Features of DMP.

Q.4 Write the short notes on the following:
   a) What is the difference between logical and physical memory?
   b) What is the role of L1 and L2 and what is their importance?
   c) What is the difference between SATA and PATA interface?
   d) What is the difference between serial port and parallel port?

**PART-B**

Q.5 a) Which is the most basic standard for bus architecture out of ISA, EISA and PCI?  
   b) Explain the working principle of Small Computer System Interface (SCSI).

Q.6 a) List the sequence of events which take place during POST.
   b) Why there is a requirement of SMPS? Explain the role of SMPS in safety of hardware devices.
Q.7  a) Give five examples of financial frauds using information technology.
    b) Give five examples where security of VVIPs have been compromised using
        information technology glitches.
Q.1 Write the answers very briefly:
   a) What do you understand by scope of a variable?
   b) What is a NULL pointer?
   c) Write the syntax of for loop.
   d) What is a static variable?
   e) What is the purpose of the keyword type def?
   f) What is a pre-processor?
   g) What are command line arguments?
   h) Define an array.
   i) Who designed ‘C’ programming language?
   j) What is recursion?

PART-A

Q.2 Why are arrays required in ‘C’ programming language? Discuss and explain how one dimensional array are declared and initialized in ‘C’ give suitable examples.

Q.3 a) Explain the different types of loops in ‘C’ with syntax and example.
     b) Write a program to read a line of text and output the number of words and characters in it.

Q.4 a) Explain the use of break and continue statement in loops with examples.
     b) Differentiate between call-by-value and call-by-reference with example.

PART-B

Q.5 Define a structure type called timestruct containing 3 members called hour, minute and second. Develop a program that would assign values to the individual members and display the time in the form 16:40:30.

Q.6 What is a file? How files are declared in ‘C’ language? Discuss various input-output operations on files.

Q.7 a) What is dynamic memory allocation? Write and explain the different dynamic memory allocation functions in C.
     b) Write and explain any two pre-processor directives in C.
     c) Explain array of structures with example.
Q.1 Fill in the blanks:
   a) A bubbled and GATE is equivalent to a ________________
   b) What is an inverts?
   c) The number of rows in the truth table of a 4 input gate is___________.
   d) How many bits are required to store one BCD digits?
      i) 1   ii) 2   iii) 3   iv) 4
   e) In Boolean algebra A.A is equal to
      i) A      ii) A^2   iii) 2A   iv) 1
   f) Is complement of 11001010 is:
      i) 11001011  ii) 11001001  iii) 00110101  iv) 00110111
   g) A half adder is a ______________ circuit.
   h) An n variable k-map can have
      i) n^2 cells   ii) 2^n cells   iii) n^2 cells   iv) n2^n cells.
   i) In an S-R flip flop, S=1, R-1 _____________ permitted.
   j) The De Morgan’s theorem states that ______________.  

Q.2 a) Convert the following:
   i) (B9F.AE)_{16}   ( )_{8}
   ii) (756.603)_{8}   ( )_{16}
   iii) (49056)_{10}   ( )_{2}
   iv) (AB 6)_{16}   ( )_{10}
   v) (AF9.BoD)_{16}   ( )_{2}  
   b) i) Generate the hamming code for data bits 1101
       ii) What are logic gates? Explain basic gates with the help of suitable logic diagram
           and truth table.  

Q.3 Answer the following:
   a) State and express De Morgan’s theorem.  
   b) Reduce the expression \( f = \overline{A}B + \overline{A} + AB \).  
   c) Show that \( AB + ABC + B\overline{C} = AB + B\overline{C} \).  
   d) What are universal Gates? Implement all basic gates using NAND and NOR gates. 

Q.4 Simplify the following using k-map:
   a) \( F (A,B,C,D) = \Sigma m \ (0,3,5,6,9,11,13,14,15) \)  
   b) \( F (A,B,C,D) = \Sigma m \ (5,6,7,9,10,11,13,14,15) \)  

Q.5 With the help of a logic diagram and a truth table, explain the working of full adder.  

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**PART-A**

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**PART-B**
Q.6  a) What are flip-flops? Explain the working of J-K master-slave flip-flop with the help of logic diagram.
    b) Differentiate between combinational and sequential circuits with suitable examples.

Q.7  Write short notes on the following:
    a) Virtual memory Vs Cache memory.
    b) Classification of memory.
Q.1  Multiple choice questions:
   a) Why is a demultiplexer called a data distributor?
      i) the input will be distributed to one of the outputs.
      ii) One of the inputs will be selected for the output.
      iii) The output will be distributed to one of the inputs.
      iv) None of the mentioned.
   b) The binary number 10101 is equivalent to decimal number.
      i) 19
      ii) 12
      iii) 27
      iv) 21
   c) Operation carried out by NOT gate are also termed as:
      i) Inventing
      ii) Converting
      iii) Reverting
      iv) Reversing
   d) A flip flop circuit can be used for:
      i) Counting.
      ii) Scaling
      iii) Rectification.
      iv) Modulation
   e) One bit full adder can be designed using:
      i) One half adders and one OR gate.
      ii) Two half adders.
      iii) One EX-OR and two NAND gates.
      iv) Two EX-OR and four NAND gates.
   f) Table used to show possible combination of inputs for an output is said to be:
      i) logic table
      ii) gate table.
      iii) System circuit table
      iv) Truth table.
   g) A toggle flip flop can be constructed using a JK flip flop by connecting the
      i) Toggle input to J and inverted form of toggle input to K
      ii) The toggle input to J
      iii) Input form of toggle input to K.
      iv) None of the above.
   h) In computers, subtraction carried out generally by __________.
      i) 1’s complement method.
      ii) 2’s complement method
      iii) Signed magnitude method
      iv) BLD subtraction method.
   i) Cache memory works on the principle of __________.
      i) Locality of data
      ii) Locality of memory.
      iii) Locality of reference
      iv) Locality of reference and memory
   j) Which of the following is not a weighted code?
      i) Decimal number system
      ii) Excess 3 code.
      iii) Binary number system
      iv) None of these

Write short notes on:
   k) Character representation.
   l) Processor and its types.

PART-A

Q.2  a) Convert the following:
(163.875)_{10} = ( )_2=( )_8=( )_{16}

(2EBY)_{16} = ( )_2=( )_8=( )_{10}

b) Construct Hamming code for 0110. Use even parity. Also explain how hamming code can be used to detect and correct the error.

Q.3 a) Why gates are required in a computer? Explain all the basic gates with truth table and logic diagram.

b) Implement the following Boolean expression using universal gates:
  i) $\bar{A}B + A\bar{D} + ABC$
  ii) $\bar{X}Y + \bar{X}Z + XYZ$

Q.4 a) Design a combinational circuit with three inputs $x, y, z$ and three outputs A, B, C when the binary input 0, 1, 2 or 3 the binary output is one greater than the input. When the binary input is 4, 5, 6 or 7 the binary output is one less than the I/P.

b) Simplify the Boolean function using K-map:
  i) $F(A, B, c) = \sum(0,2,3,4,6)$
  ii) $F(A, B, C, D) = \sum(3,7,11,13,14,15)$

PART-B

Q.5 a) Construct a 5 to 32 line decoder with four 3 to 8 line decoder with enable and one 2 to 4 line decoder.

b) What is a combinational circuit? Draw and explain the working of full subtractor with truth table.

Q.6 a) Draw a 4 bit binary synchronous counter and explain its working.

b) What is a sequential circuit? Explain the types of flip flops with its characteristics table.

Q.7 Write short notes on the following:
  a) Parallel processing.
  b) Virtual memory.
Q.1 Multiple choice questions:

a) Which of the following is not a valid C variable name?
   i) int number;  
   ii) float rate;  
   iii) int variable_count;  
   iv) int $main;

b) The modulus operator cannot be used with a long double.
   i) True  
   ii) False

c) The way the break is used to take control out of switch and continue to take control of the beginning of the switch?
   i) Yes  
   ii) No

d) What will happen if in a C program you assign a value to an array element whose subscript exceeds the size of array?
   i) The element will be set to 0.  
   ii) The compiler would report an error.  
   iii) The program may crash if some important data gets overwritten.  
   iv) The array size would appropriately grow.

e) Does this mentioning array name gives the base address in all the contexts?
   i) Yes  
   ii) No

f) A conditional operator is the replacement of:
   i) Simple if  
   ii) If with else  
   iii) Nested if  
   iv) None of the above

g) Which of the following are unary operators in C?
   i) !  
   ii) sizeof  
   iii) ~  
   iv) &&

h) Translator includes:
   i) Compilers  
   ii) Interpreter  
   iii) Assemblers  
   iv) All of the above

i) RAM and ROM are the example of
   i) Primary memory  
   ii) Secondary memory  
   iii) Ternary memory  
   iv) All of the above

j) "If within another if" is also known as:
   i) Multiple if  
   ii) Nested if  
   iii) If with else  
   iv) All of the above

Fill in the blanks:

k) A function cannot return more than __________ values.

l) The variables declared in a structure definition are called __________.

m) The content of pointer variable is __________ of another variable.

n) C language uses __________ number of reserve words.

o) Do while is a __________ control loop.

PART-A
Q.2  
a) Explain different types of computer memories with the help of a diagram.  
b) Step down the flow chart to make a "cup of tea."  

Q.3  
a) Explain different types of operators available in C language.  
b) Write a program to reverse a 4 digit number.  

Q.4  
How many types of loops are available in C language? Explain each with a small program.  

PART-B

Q.5  
a) What are the advantages and limitation of array? Explain through example.  
b) Write down the syntax and purpose of following function:  
   strcat(), strcmp(), strlen(), strcpy().  

Q.6  
a) Explain following:  
   i) Function prototype.  
   ii) Function calling.  
   iii) Function declaration.  
b) What do you understand by recursion? Explain through an example.  

Q.7  
a) Differentiate between following:  
   i) Structure and union.  
   ii) Static memory allocation and dynamic memory allocation.  
b) Write a program to accept the records of 5 students with details name, age, address, total_marks & display the record of the student having maximum marks.  

Q.1 Multiple choice questions:

a) A procedure that calls itself is called:
   i) Illegal call
   ii) Reverse polish.
   iii) Recursive.
   iv) None of the above.

b) Stack is also called as:
   i) Last in first out.
   ii) First in last out.
   iii) Last in last out.
   iv) First in first out.

c) Which data structure allows deleting data elements from and inserting at rear?
   i) Stacks
   ii) Queues
   iii) Dequeues
   iv) Binary search tree

d) Which data structure is used in breadth first search of a graph to hold nodes?
   i) Stack
   ii) Queue
   iii) Tree
   iv) Array

e) Which of the following data structure is non-linear type?
   i) Strings
   ii) Lists
   iii) Stacks
   iv) Graph

f) Header node is used as sentinel in ________.
   i) Graphs
   ii) Stacks
   iii) Binary tree
   iv) Queues

g) The number of comparisons done by sequential search is:
   i) \((N/2)+1\)
   ii) \((N+1)/2\)
   iii) \((N-1)/2\)
   iv) \((N+2)/2\)

h) Which of the following is not the internal sort?
   i) Insertion Sort
   ii) Bubble Sort
   iii) Merge Sort
   iv) Heap Sort

i) What will be the value of top, if there is a size of stack STACK_SIZE is 5:
   i) 5
   ii) 6
   iii) 4
   iv) None

j) A graph is said to be __________ if the vertices can be split into two sets VI and V2 such there are no edges between two vertices of VI or two vertices of V2.
   i) Partite
   ii) Bipartite
   iii) Rooted
   iv) Bisects

Q.2 What do you mean by array? Explain two dimensional arrays with the help of an example. 15

Q.3 Write down the algorithm to implement stack. 15

Q.4 Write an algorithm to implement the following in a link list:
   a) Deleting a node.
   b) Creating first node.
Q.5 Create a binary search tree with following values: (78, 57, 34, 89, 56, 12, 65, 46, 38, 90, 23, 55, 17, 86, 49)

UNIT-III

Q.6 What do you mean by graph? How it is different from tree? Explain any terminology used with graph.

Q.7 Sort the list of given numbers using bubble sort. The list is (23, 11, 54, 34, 67, 58, 32, 89, 87, 65).

UNIT-IV

Q.8 What do you mean by Hashing? Explain any five functions of hashing with an example of each.

Q.9 What do you mean by 'file organization'? State the difference between sequential and indexed sequential file organization.
End Semester Examination, Dec. 2018
BCA – Second Semester (Batch 2013)
MATHEMATICAL FOUNDATION OF COMPUTER SCIENCE (BCA-202)

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. Marks are indicated against each question.

Q.1 Answer the following:
   a) Euler graph.
   b) Weighted graph.
   c) Injective function.
   d) Equivalence relation.
   e) Multisets.

UNIT-I

Q.2 a) Prove by induction that:
   \[ 1 \cdot 3 + 3 \cdot 5 + 5 \cdot 7 + \ldots + (2n-1)(2n+1) = \frac{n(4n^2 + 6n - 1)}{3} \]
   b) Prove that \( A \times (B \cup C) = (A \times B) \cup (A \times C) \).

Q.3 a) In a recent survey of 5000 people, it was found that 2800 read Indian Express' and 2300 read 'Times of India'; while 400 read both the papers. How many read neither 'Indian Express' nor 'Times of India'.
   b) State and prove pigeon hole principle and give two examples.

UNIT-II

Q.4 a) Let \( A = \begin{bmatrix} 1 & 0 & 1 \\ 0 & 1 & 1 \\ 1 & 1 & 0 \\ 0 & 0 & 0 \end{bmatrix} \) and \( B = \begin{bmatrix} 1 & 1 & 0 \\ 1 & 0 & 1 \\ 0 & 0 & 1 \\ 1 & 1 & 0 \end{bmatrix} \) compute \( A \lor B \) and \( A \land B \).
   b) Minimize the 4-variable logic function using k-map:
   \[ f(A, B, C, D) = \sum(0,1, 2,3,5,7,8,9,11,14) \]

Q.5 Consider the set \( D_{50} = \{1,2,5,10,25,50\} \) and the relation divides (\( / \)) be a partial ordering relation on \( D_{50} \):
   a) Draw the Hasse diagram of \( D_{50} \) with relation divides.
   b) Determine all upper bounds of 5 and 10.
   c) Determine all lower bounds of 5 and 10.
   d) Determine \( g.l.b \) of 5 & 10
   e) Determine \( l.u.b \) of 5 & 10

UNIT-III

Q.6 a) Solve the difference equation \( 2a_r - 5a_{r-1} + 2a_{r-2} = 0 \) and find particular solution such that \( a_0 = 0 \) and \( a_1 = 1 \).
b) Define the following:
   a) Recurrence relation.
   b) Degree and order of recurrence relation.

Q.7  a) Find the centroid of triangle whose vertices are: $(3, -5), (-7, 4), (10, -2)$.
     b) Show that the points $A(1, 0), B(5, 3), C(2, 7)$ and $D(-2, 4)$ are the vertices of a parallelogram.

UNIT-IV

Q.8  a) Differentiate between graph and tree.
     b) Determine the minimum spanning tree for the following graph:

Q.9  Find the shortest path from $a$ to $z$ in the graph:
Q.1 Answer the following multiple choice questions:

a) Which of the following data structure store the homogenous data elements?

b) The operation of processing each element in the list is known as:
   i) Traversal. ii) Insertion. iii) Merging. iv) Sorting.

c) In binary trees node with no successor are called:
   i) End node. ii) Final node. iii) Last node. iv) Terminal node.

d) The smallest element of an array’s index is called its:

e) The data structure required for breadth first search traversal on a graph is:
   i) Queue. ii) Stack. iii) Array. iv) None of the above.

f) The DS required to evaluate a postfix expression is:
   i) Queue. ii) Stack. iii) Linklist. iv) All of the above.

g) Which of the following terms are used in a tree:
   i) Root. ii) Leaf node. iii) Sibling. iv) All of the above.

h) The postfix form of A*B+C/D is:
   i) ABCD+/* ii) AB*CD/+ iii) *AB/CD+ iv) A*BC+D/

i) When new data are to be inserted into a DS, But there is no available space, the situation is usually called:

j) The number of leaf node in a complete binary tree of depth \(d\) is:
   i) \(2^d\) ii) \(2^{d-1}+1\) iii) \(2^{d+1}+1\) iv) \(2^d+1\)

PART-A

Q.2 a) Explain different types of operations that can be performed on a data structure.  

b) Write a program to find the sum of all elements of an integer array.

Q.3 a) Convert the following infix expression into its postfix equivalent:

\[(A + B) * C / D + E ^ F / G .\]

b) Consider the following queue of characters, where QUEUE is a circular array which is allocated six memory cells FRONT = 2 REAR = 4 QUEUE: _____ A, C, D, _____
Q.4  
a) What do you understand by dynamic memory allocation? What are its different advantages over static allocation?  

b) Write some basic operation that can be performed on a link list.  

Q.5  
a) Find the inorder, preorder and postorder traversal of given tree:

```
    50
   /  
  45   55
 /     / 
43  48 53 60
 /   /   / 
26 49 58 65
```

b) Write short notes on the following:
   i) B tree.  
   ii) General tree.  
   iii) Threaded binary tree.  
   iv) Complete binary tree.  
   v) FIFO structure.  
   vi) Graph.  

Q.6  
a) Write an algorithm to traverse a graph using breath first search method. Trace your algorithm using an example.  

b) Explain following with the help of a diagram:
   i) Degree of a vertex.  
   ii) Path of a tree.  
   iii) Loop in a tree.  
   iv) Isolated node.  
   v) Strongly connected graph.  

Q.7  
a) Explain any five hashing function with an example of each.  

b) Sort the following values using selection sort:
   29, 38, 46, 11, 18, 47, 32, 58, 28, 6, 15, 35
Q.1 Answer the following multiple choice questions:
   a) The attribute than can be divided into other attributes is called:
      i) Simple attributes.  ii) Composite attribute.
      iii) Multivalued attribute.  iv) Derived attribute.
   b) In E-R diagram, diamond represents:
      i) Attributes.  ii) Multi-valued attributes.
      iii) Weak entity sets.  iv) Relationship sets.
   c) UML stands for:
      i) Universal modeling language.  ii) Unified modeling language.
      iii) United modeling language.  iv) Uni modeling language.
   d) A relation that has no partial dependency in which normal form:
      i) First.  ii) Second.
      iii) Third.  iv) BCNF.
   e) An instance is:
      i) Particular occurrence of an entity.  ii) Special types of relation.
      iii) An attribute of entity.  iv) Any particular entity.
   f) In entity-relationship diagram “Double Rectangles” represents:
      i) Relationship sets.  ii) Weak entity sets.
      iii) Derived attribute.  iv) Multi-valued attributes.
   g) Which is not an aggregate function?
      i) MIN.  ii) MAX.
      iii) Select.  iv) AVG.
   h) An attribute of table cannot hold multiple values is property of:
      i) First normal form (1NF).
      ii) Second normal form (2NF).
      iii) Third normal form (3NF).
      iv) Fourth normal form (4NF).
   i) How many rules in “Codd rules” of relational model of database systems?
      i) 11.  ii) 12.
      iii) 13.  iv) 14.
   j) DBA stands for:
      i) Data bank access.  ii) Database access.
      iii) Databank administration.  iv) Database administrator.

**PART-A**
Q.2  a) What is DBMS and what are the components of DBMS? Explain with suitable example.  
      b) Differentiate Traditional file system and DBMS. Also, explain few applications of DBMS.  
      
Q.3  a) Design an Entity-Relationship diagram of student database.  
      b) Explain Hierarchal and Network model with proper examples.  
      
Q.4  a) What are various mathematical function of SQL?  
      b) Explain primary key and foreign key with their usage using suitable examples. Also, explain the concept and usage of Check constraint with suitable examples.  

PART-B

Q.5  a) What is Functional Dependency? What are Armstrong rules of functional dependency?  
      b) Explain 1st, 2nd and 3rd normal form with suitable example.  
      
Q.6  a) What are locks? What are different types of locks and various locking operations?  
      b) What is deadlock? Explain the techniques of deadlock prevention.  
      
Q.7  What are distributed database systems? Explain the architecture along with advantages and disadvantages of distributed database systems with suitable examples.
Q.1 Answer the following multiple choice questions:

a) BCA stands for:
   i) Boolean code definition. ii) Binary coded division.
   iii) Binary coded decimal. iv) None of the above.

b) In which of the following gates, the output is 1 if and only if at least one input is 1
   i) OR ii) NOR.
   iii) AND iv) NAND.

c) The simplified form of the Boolean expression \((x + y + z)(x + z)\) is:
   i) \(x+y+z\) ii) \(xy+xz\)
   iii) \(x+y\) iv) \(xz+y\)

d) Logic gates with a set of inputs and outputs is arrangement of:
   i) Combination circuit. ii) Logic circuit.
   iii) Design circuit. iv) Register.

e) A ________ is a circuit which can remember values for a long time or change values when required:
   iii) Memory element. iv) Complex circuit.

f) The ALU makes use of ________ to store the intermediates results.
   a) Accumulators. b) Registers.
   c) Heap. d) Stack.

g) The decoded instructions is stored in ________.
   a) IR. b) PC.
   c) Registers. d) MDR.

h) There are two types of parity:
   a) True and false. b) 0 and 1.
   c) Even and Odd. d) None of the above.

i) I/o function allows to exchanges data directly between an:
   a) Process states.
   b) Registers.
   c) I/O modules and the processor.
   d) None of the above.

j) I/o interrupt driven is more efficient than:
   i) I/o modules. ii) I/o devices.
   iii) Programmed I/o. iv) CPU.

UNIT-I

Q.2 Perform the following:

a) \((126.7)_{10} = (\quad)_{2} = (\quad)_{10} = (\quad)_{16}\)

b) \(67-23\) using 2’S complement arithmetic.

c) \((ABC\times A)_{16} - (123\times DE)_{16}\).

Q.3 Write short notes on the following:
a) Complements in number system.  
b) Hamming code.  
c) ASCII code.  

**UNIT-II**

Q.4 Simplify the following using K-Map:  
a) \( F(A, B, C) = \overline{\Lambda} \ \ (1,2,3,4,7) \).  
b) \( F(X, Y, Z) = p(0,2,4,5) \).  

Q.5 What are universal gates? Explain in detail.  

**UNIT-III**

Q.6 What is an instruction format? Explain zero, one, two and three address instructions? Which one is better and why? Explain with suitable reasons.

Q.7 Write short notes on the following:  
a) Memory hierarchy.  
b) RISC v/s CISC.

**UNIT-IV**

Q.8 What is asynchronous data transfer? Explain in detail handshaking based data transfer.

Q.9 Why does DMA have priority over the CPU when both request a memory transfer? Explain DMA transfer using block diagram.
End Semester Examination, Dec. 2018
BCA – First Semester
DATABASE MANAGEMENT SYSTEM (BCA-204A (CB))

Time: 3 hrs.  Max Marks: 100
No. of pages: 1

Note: Attempt **FIVE questions in all; Q.1 is compulsory.** Attempt any **TWO questions from PART-A** and **TWO questions from PART-B**. Marks are indicated against each question.

Q.1  _Fill the correct answer:_
   a) Database approach is better than file based approach due to ___________.
   b) A database schema refers to ___________.
   c) Attributes can be defined as ___________.
   d) Candidate key is ___________.
   e) Four properties of a transaction are ___________.

   _Answer the following in brief:_
   f) Explain any two roles of DBA.
   g) Define locks. What are the two types of locks used in concurrency control?
   h) Write any two reasons for system crash.
   i) What is arity of a Relation?
   j) Write the syntax of creates command with example.  

   **2×10**

**PART-A**

Q.2  a) Differentiate between data and information. Define DBMS with suitable example.  
   b) Discuss various advantages and disadvantages of DBMS. Also explain the various 
      applications of database in one day to day life.

   **5**
   **15**

Q.3  a) Explain the various roles of DBA for effective functioning of databases.  
   b) What is data independence? Explain logical and physical data independence with 
      suitable example.

   **10**
   **10**

Q.4  Write short notes of the following with suitable example:
   a) Primary key and foreign key.
   b) Set operations in relational algebra.
   c) SQL
   d) Hierarchical model.

   **5×4**

**PART-B**

Q.5  What are database anomalies? Explain normalization of relations upto three levels to 
      remove various anomalies. Three level means INF, 2NF and 3NF.

   **20**

Q.6  Define transactions and ACID properties of transaction. Draw state transition diagram 
      for various states.

   **20**

Q.7  What is database security? Explain the importance of security in database environment 
      considering various security risks.

   **20**
Q.1 Multiple choice questions:
   a) Search engines are used to
      i) Search video
      ii) Search documents
      iii) Download softwares
      iv) All of these
   b) A computer on internet is identified by
      i) E-mail address
      ii) Street address
      iii) IP address
      iv) Server address
   c) HTML program can be read and rendered by
      i) Compiler
      ii) Web browser
      iii) Server
      iv) Interpreter
   d) Seeds of internet were planted in
      i) 1969
      ii) 1970
      iii) 1960
      iv) 1980
   e) A search engine which is a tool that uses another search engine data to produce their own results from internet are known as
      i) Advance search engine
      ii) Metasearch engine
      iii) Search tool
      iv) Boolean search engine
   f) Verification of a login name and password is called
      i) Configuration
      ii) Accessibility
      iii) Authentication
      iv) Logging in
   g) In OSI network architecture, the dialog control and token management are responsibility of
      i) Session layer
      ii) Network layer
      iii) Transport layer
      iv) Data limit layer
      v) None of above
   h) Why would a hacker use a proxy server?
      i) To create a stronger connection with the target.
      ii) To create a short server on the network.
      iii) To obtain a remote access connection.
      iv) To hide malicious activity on the network.
   i) What is the purpose of a denial of service attack?
      i) Exploit a weakness in the TCP/IP attack.
      ii) To execute a trojan on a system.
      iii) To overload a system so it is no longer operational.
      iv) To shut down services by turning them off.
   j) What port does telnet use?
      i) 22
      ii) 80
      iii) 20
      iv) 23
   k) Write short notes on:
      i) Identity theft.
      ii) DHCP header.
PART-A

Q.2  a) Differentiate between intranet, extranet and internet.  
 b) How do we connect to the internet? Explain the different ways by taking real life examples.

Q.3  a) Explain the working of any search engine of your choice. 
 b) Explain the structure of E-mail.

Q.4  a) What is a DNS? What are DNS queries? Explain its various types? 
 b) Differentiate between public FTP server and private FTP server.

PART-B

Q.5  a) Elaborate the human right issues involved on the Internet. 
 b) What are copyright laws? Why it plays an important role in protecting the privacy of documents?

Q.6  Write short notes on: 
 a) Cross-site scripting. 
 b) Password cracking.

Q.7  a) List down the various server browser settings that can be done on a computer to protect ourselves from cyber crime. 
 b) What is an identity theft? Explain with the help of an example.
End Semester Examination, Dec. 2018  
Bachelor of Computer Application – Third Semester  
NUMERICAL ANALYSIS AND STATISTICAL TECHNIQUES  
(BCA-301 (CB))

Time: 3 hrs.  
Max Marks: 100  
No. of pages: 2

Note: Attempt FIVE questions in all; Q.1 is compulsory. Attempt any TWO questions from Part-A and TWO questions from Part-B. Marks are indicated against each question.

Q.1  
a) If 0.333 is approximate value of $\frac{1}{3}$, find absolute error.  
b) Find the relative error if $\frac{2}{3}$ is approximated to 0.667.  
c) Define correlation.  
d) State Newton’s divide difference formula.  
e) Construct backward difference table of following values:
   \( x: 0 \ 1 \ 2 \ 3 \ 4 \)  
   \( y: 9 \ 28 \ 65 \)  
f) The mean and variance of binomial distribution is _______ and _______.  
g) The average marks secured by 36 students was 52. But it was discovered that an item 64 was mistread as 46. Find the correct mean of marks.  
h) The root of the equation \( x^3 - 2x - 5 = 0 \) lies between _________.  
i) Define interpolation.  
j) Write down the formula of normal equation for fitting the straight line \( y = ax + b \).  

PART-A

Q.2  
a) Use Bisection method to find out the positive square root of 30 correct to I decimal places.  
b) Find the missing values in the table:
   \( X: \ 45 \ 50 \ 55 \ 60 \ 65 \)  
   \( Y: \ 3 \ - \ 2 \ - \ 6.4 \)  

Q.3  
a) The population of a town was as given. Estimate the population for the year 1925.
   \[
   \begin{array}{|c|c|c|c|c|c|}
   \hline
   \text{Year (}x\text{):} & 1891 & 1901 & 1911 & 1921 & 1931 \\
   \hline
   \text{Population (}y\text{):} & 46 & 66 & 81 & 93 & 101 \\
   \hline
   \end{array}
   \]

b) Using Lagrange’s interpolation formula, find y from the following table:
   \( X: \ 5 \ 6 \ 9 \ 11 \)  
   \( Y: \ 12 \ 13 \ 14 \ 16 \) 

Q.4  
a) Evaluate \( \int_0^1 \frac{dx}{1+x^2} \) using:
   i) Simpson’s \( \frac{1^d}{3} \) rule.
ii) Simpson’s \( \frac{3}{8} \) rule. 

b) Solve the equation \( \frac{dy}{dx} = 1 - y \) with the initial condition \( x = 0, y = 0 \) using Euler’s algorithm and tabulate the solutions at \( x = 0.1, 0.2, 0.3 \).

**PART-B**

Q.5 Calculate the mean, median and mode from the following data:

<table>
<thead>
<tr>
<th>Wages in Rs.</th>
<th>No. of workers</th>
</tr>
</thead>
<tbody>
<tr>
<td>30-35</td>
<td>12</td>
</tr>
<tr>
<td>35-40</td>
<td>18</td>
</tr>
<tr>
<td>40-45</td>
<td>22</td>
</tr>
<tr>
<td>45-50</td>
<td>27</td>
</tr>
<tr>
<td>50-55</td>
<td>17</td>
</tr>
<tr>
<td>55-60</td>
<td>23</td>
</tr>
<tr>
<td>60-65</td>
<td>29</td>
</tr>
<tr>
<td>65-70</td>
<td>8</td>
</tr>
</tbody>
</table>

Q.6 A box contain 100 transistors, 20 of which are defective, 10 are selected for inspection. Indicate what is the probability that

a) all 10 are defective.

b) all 10 are good.

c) atleast one is defective.

d) atmost 3 are defective.

Q.7 Explain the following terms:

a) Random sampling.

b) Stratified random sampling.
End Semester Examination, Dec. 2018  
Bachelor of Computer Application – Third Semester  
MATHEMATICS-II (BCA-301)

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

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

Q.1 a) Define a ‘identity matrix’.
   b) Solve: $15_c$.
   c) Give an example of a ‘non-singular matrix’.
   d) Explain G.L.B.
   e) What is a ‘convergent sequence’?
   f) Write ‘Maclaurin’s series’.
   g) Find the value of $|A| = \begin{bmatrix} 5 & -2 \\ 3 & 1 \end{bmatrix}$.
   h) Solve: $\begin{bmatrix} 9 \\ 4\end{bmatrix}$.
   i) Expand: $(5a + 3b)^3$.
   j) Evaluate: $P(8, 8)$.

UNIT-I

Q.2 a) If $A = \begin{bmatrix} 3 & -2 \\ 4 & -2 \end{bmatrix}$ and $I = \begin{bmatrix} 1 & 0 \\ 0 & 0 \end{bmatrix}$,
Then find the matrix $(K)$ so that $A^2 = KA - 2I$.
   b) Find $A^{-1}$, where:
   
   $A = \begin{bmatrix} 1 & 2 & -3 \\ 2 & 3 & 2 \\ 3 & -3 & -4 \end{bmatrix}$

Q.3 a) Solve the following system of equations:
   $5x + 2y = 4$
   $7x + 3y = 5$
   b) How many three digit odd numbers can be formed from the digits 1, 2, 3, 4, 6 when
   i) Repetition of digits is not allowed.
   ii) Repetition of digits is allowed.

UNIT-II

Q.4 a) Prove that union of finite number of denumerable sets is denumerable.
   b) Prove that the set (R) of all real numbers is uncountable.

Q.5 a) Prove that greatest lower bound of a set if it exists is unique.
   b) Find the least upper bound and greatest lower bound if exist:
   $\{x : x = 3^n, n \in N\}$
UNIT-III

Q.6  a) Prove that every convergent sequence is bounded but not conversely.
    b) By definition, show that the sequence \( \left\{ \frac{1}{n^2} \right\} \) converges to \((0)\).

Q.7  a) State and prove comparison test of 1st form.
    b) If \( <u_n> \) converges to \((u)\) and \( <v_n> \) converges to \((v)\), prove that \( <u_n + v_n> \) converges to \((u + v)\).

UNIT-IV

Q.8  a) Show that \( \lim_{x \to 0} \frac{e^x - \log \left( \frac{1-x}{e} \right)}{\tan x - x} = \frac{-1}{2} \) by L’Hospital Rule.
    b) Expand \( \log(1 + x) \) in powers of \(x\) by using Maclarin’s theorem.

Q.9 Show that if \( x > 0, \log(1 + x) > \frac{x}{1+x} \) and hence prove that \( x^{-1} \log(1+x) \) decreases monotonically as \((x)\) increases from 0 to \(\infty\).
End Semester Examination, Dec. 2018
BCA – Third Semester
OBJECT ORIENTED PROGRAMING USING C++ (BCA-302 (CB))

Time: 3 hrs. Max Marks: 100
No. of pages: 1

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

Q.1 a) Two OOP languages are _______ and ________.
b) _______ and _______ are two ways of passing parameters to a function in C++.
c) Array is a ________ data type.
d) In _______ inheritance, a parent class has two or more derived classes.
e) _______ is a syntax of while statement in C++.
f) _______ and _______ operators are used for dynamic memory management.
g) _______ and _______ are two types of constructors available in C++.
h) Give one advantage of operator overloading.
i) _______ is a stream class for handling I/O operations in C++.
j) This is a ______ in C++.

PART-A

Q.2 a) Compare and contrast OOP language and procedural programming language.
b) Explain briefly five important features of C++.

Q.3 Differentiate the following:
a) For statement and while statement.
b) If statement and switch statement.
c) Call-by-value and call-by-address.
d) Variable and constant.

Q.4 a) What is friend function? Explain its need with the help of an example.
b) Write a program explaining the need of static data member in a class.

PART-B

Q.5 Explain the following using suitable examples:
a) Constructor.
b) Operator overloading.
c) Destructor.
d) String.

Q.6 Differentiate the following:
a) Virtual base class and abstract class.
b) Virtual function and pure virtual function.
c) Early binding and late binding.

Q.7 a) Explain five I/O operations used to format output in C++.
b) Explain the process of exception handling in C++.
Q.1 Multiple Choice Questions:

a) Which type is best suited to represent the logical values?
   i) integer.   ii) Boolean.   iii) character.   iv) all of the mentioned.

b) What does a reference provide?
   i) Alternate name for the class.   ii) Alternate name for the variable.   iii) Alternate name for the pointer.   iv) None of the mentioned.

c) Where does the execution of the program starts?
   i) user-defined function.   ii) main function.   iii) void function.   iv) none of the mentioned.

d) We can prevent a function from throwing any exceptions.
   i) True.   ii) False.

e) If a class contains pure virtual function, then it is termed as _________.
   i) Virtual class.   ii) Sealed class.   iii) Pure Local class.   iv) Abstract Class.

f) While overloading binary operators using member function, it requires ______ argument/s
   i) Zero.   ii) One.   iii) Two.   iv) Three.

g) In CPP, cin and cout are the predefined stream ________.

h) Scope resolution operator is used ________.
   i) to resolve the scope of global variables only.
   ii) to resolve the scope of functions of the classes only.
   iii) to resolve scope of global variables as well as functions of the classes.
   iv) None of these.

i) When a child class inherits traits from more than one parent class, this type of inheritance is called __________ inheritance.

j) Is it possible to define a constructor with default arguments?
   i) Yes.   ii) No.  

Write short notes on:

k) This pointer.
l) Stream classes.

PART-A


Q.3 a) Describe inline function in C++ with example.  
b) Explain the datatypes in C++. Explain user defined data types with examples.
Q.4  
  a) Can we use the same function name for a member function of a class and an outside function in the same program file? If yes, how are they distinguished? If no, give reasons?  
  b) Explain the uses of private and public keywords. How are they different from each other?  

Part-B

Q.5  
  Define operator overloading? How to overload a unary operator and a binary operator, explain with examples. Give a programming example that overloads = = operator with its use.  

Q.6  
  a) In what order are the class constructor called when a derived class object is created?  
  b) Differentiate between:  
     i) Single V/S Multiple Inheritance.  
     ii) Early V/S Late Binding.  

Q.7  
  a) What is a stream? Describe the features of I/O system supported by C++.  
  b) How is an exception handled in C++? Explain with a programming example.
Q.1 a) Array in C++ is ________ data type.  
1  
b) Constructor is executed when _________.  
1  
c) ________ and ________ are types of inheritance available in C++.  
2  
d) The syntax of DO while statement in C++ is ____________.  
2  
e) ________ and ________ statements are used in Exception Handling.  
2  
f) One of the disadvantages of using Friend function is ________.  
2  
g) ________ is an example of user defined data type in C++.  
1  
h) ________ and ________ are two logical operators in C++.  
2  
i) ________ and ________ are examples of binary operators in C++.  
2  

UNIT-I

Q.2 a) Compare and contrast object oriented programming language with procedure programming language.  
10  
b) Explain the following terms:  
   i) Data Abstraction.  
   ii) Inheritance.  
2½x2

Q.3 a) “Object oriented programming language provides data security”. Justify this statement with the help of an example.  
10  
b) Explain the concept of operator overloading with the help of an example.  
5

UNIT-II

Q.4 Explain the following with the help of suitable examples:  
a) Friend function.  
b) Array.  
c) Static data members.  
5x3

Q.5 a) Explain how the use of Friend function risks data security in C++ with the help of an example.  
10  
b) Give two examples of formatting the output with the help of manipulators.  
5

UNIT-III

Q.6 Give two examples of each of the following with proper syntax:  
a) Constructor.  
b) Operator Overloading.  
c) Virtual Function.  
5x3

Q.7 a) Explain the concept of Abstract class with the help of suitable example.  
10  
b) What is Destructor? Explain its use with the help of an example.  
5

UNIT-IV

Q.8 a) What kind of ambiguity arises in multipath inheritance? Give suitable example to support our answer.  
10  
b) Explain two types of inheritance available in C++.  
5
Q.9  a) Explain the need of exception handling using suitable examples.  
    b) Explain the concept of Function overriding with the help of an example.
Q.1  a) What is race condition during process synchronization?
    b) How microkernel is different from monolithic kernel?
    c) Why do we to use virtual memory in operating system?
    d) What is multithreading operating systems?
    e) Differentiate between physical memory address space from logical memory address space.
    f) What are overlays?
    g) What is fragmentation?
    h) What are device derivers?
    i) What is NOS?
    j) What is plumbing/piping?

2×10

PART-A

Q.2  a) What inconveniences that a user can face while interacting with a computer systems, when a system is not multiprogramming system? Support your answer with example.
    b) Differentiate NOS and distributed operating systems. Give their advantages and disadvantages.

Q.3  a) The critical section problem for two processes was developed by Dekker. Prove that the algorithm satisfies all three requirements for the critical section problem.
    b) Consider the following scenario:

<table>
<thead>
<tr>
<th>State</th>
<th>Current Loan</th>
<th>Maximum need</th>
</tr>
</thead>
<tbody>
<tr>
<td>Process A</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Process B</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Process C</td>
<td>4</td>
<td>4</td>
</tr>
</tbody>
</table>

Total resources are: 9
Apply the Banker’s algorithm:
  i) What is the content of matrix need?
  ii) Is the system is safe state?

Q.4  Consider the following set of processes with the length of CPU burst time given in millisecond.

<table>
<thead>
<tr>
<th>Process</th>
<th>Burst time</th>
<th>Priority</th>
</tr>
</thead>
<tbody>
<tr>
<td>P₁</td>
<td>8</td>
<td>3</td>
</tr>
<tr>
<td>P₂</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>P₃</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>P₄</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>P₅</td>
<td>4</td>
<td>2</td>
</tr>
</tbody>
</table>

The processes are assumed to have arrived in order P₁, P₂, P₃, P₄, P₅ all at time 0.
a) Draw Gantt charts illustrating the executions of these processes using FCFS, SJF, a non-preemptive priority and RR (quantum = 2) scheduling.
b) What is turnaround time of each process for each of the scheduling algorithms?
c) What is average waiting time of system in each scheduling algorithm?
d) Which algorithm is best scheduling algorithm?

PART-B

Q.5 Consider the following page reference string:
1, 2, 3, 4, 2, 1, 5, 6, 2, 1, 2, 3, 7, 6, 3, 2, 1, 2, 3, 6
How many page faults would occur for the following algorithm assuming, two and three frames? Remember that all frames are initially empty, so your first unique pages will all cost one fault each:
a) LRU replacement.
b) FIFO replacement.
c) Optimal replacement.

Q.6 a) Explain the role of operating system in handling file system in detail? Support your answer with an example. 10
b) Explain directory system in detail. 10

Q.7 Write short notes on:
a) Virtual memory.
b) Disk scheduling. 10×2
Q.1 Answer the following:
   a) In priority scheduling algorithm, when a process arrives at the ready queue, its
      priority is compared with the priority of
      i) All process
      ii) Currently running process
      iii) Parent process
      iv) init process
   b) The ________ table contains the base address of each page in physical memory.
      i) Process
      ii) Memory
      iii) Page
      iv) Frame
   c) If the size of logical address space is 2 to the power of m and a page size 2 to the
      power of n addressing on it then high order _____ bits of a logical address
      designates the page no. and _____ low order bits designate the page offset.
      i) m, n
      ii) n, m
      iii) m-n, m
      iv) m-n, n
   d) A deadlock avoidance algorithm dynamically examiners, the ____ to ensure that a
      circular wait condition can never exit:
      i) resource allocation state
      ii) system storage state
      iii) operating system
      iv) Resources
   e) For most computer, the bootstrap is stored in
      i) RAM
      ii) ROM
      iii) Cache
      iv) Tertiary storage
   f) The number of process complete per unit time is ____________
   g) SJF stands for ____________
   h) Thread is a ____________
   i) Race condition is ____________
   j) Banker’s Algorithm for resource allocation deals with ____________

2×10

Q.2 Explain the operating system services that are :
   a) Provided for the convenience of the programmer to make programming easier. 10
   b) Write short notes on:
      i) Multiprogramming
      ii) Multitasking

5×2

Q.3 Consider the following set of processes with the length of CPU Burst given in ms:

<table>
<thead>
<tr>
<th>Process</th>
<th>Burst time</th>
<th>Priority</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1</td>
<td>7</td>
<td>1</td>
</tr>
<tr>
<td>P2</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>P3</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>P4</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>P5</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>P6</td>
<td>3</td>
<td>5</td>
</tr>
</tbody>
</table>
The processes are assumed to have arrived in order \( P_1, P_2, P_3, P_4, P_5, P_6 \) all at time 0.

a) Draw Gantt chart illustrating the execution of these processes using FCFS, SJF (a non-preemptive priority (a smaller number indicates high priority)) and RR (quantum = 4 ms) scheduling. 

b) Calculate the average waiting time and average turnaround time for each of the scheduling algorithms.

c) Now assume arrival time of Process \( P_1, P_2, P_3, P_4, P_5, P_6 \) is 0, 1, 2, 3, 4, 5. Calculate the average waiting time for priority scheduling (preemptive).

Q.4  
a) What are Semaphores? Explain their usage and its implementation to avoid blocking waiting.

b) Consider the following scenario:

<table>
<thead>
<tr>
<th>State</th>
<th>Current Loan</th>
<th>Maximum Need</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>B</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>C</td>
<td>3</td>
<td>6</td>
</tr>
</tbody>
</table>

Total Resources are: 9
State 2 apply the Banker’s Algorithm:

i) To find the content of need matrix

ii) Determine that the system is in safe state or not.

PART-B

Q.5  
a) Consider the segment table:

<table>
<thead>
<tr>
<th>Segment</th>
<th>Base</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>219</td>
<td>600</td>
</tr>
<tr>
<td>1</td>
<td>2300</td>
<td>14</td>
</tr>
<tr>
<td>2</td>
<td>90</td>
<td>100</td>
</tr>
<tr>
<td>3</td>
<td>1327</td>
<td>580</td>
</tr>
<tr>
<td>4</td>
<td>1952</td>
<td>96</td>
</tr>
</tbody>
</table>

What are the physical address for the following logical address:

i) 0,430
ii) 1, 10
iii) 1, 11
iv) 2,500
v) 3, 480

b) What is page fault? What is the procedure for handling the page fault? Explain with the help of a suitable example.

Q.6  
a) What is a file? Explain the various file access method a system can use to access information.

b) Suppose that a disk drive has 5000 cylinders, numbered 0 to 4999. The drive is currently serving a request at cylinder 138 and the previous cylinder was 125. The queue of pending requests in FIFO order is 88, 1470, 813, 1774, 948, 1509, 1022, 1650, 130. Starting from the current head position, calculate the total distance (in cylinders) that the disk arm moves to satisfy all the pending requests for each of the following disk scheduling:

i) FCFS
ii) SSTF
iii) SCAN
iv) Look

Q.7  
a) Explain the design principles of Windows 7.

b) How process management is done by Linux OS, Explain.
Q.1 Answer the following questions:
   a) The term ________ is used to refer to a row.
      i) Attribute.
      ii) Tuple.
      iii) Field.
      iv) Instance.
   b) The following are components of a database except ________.
      i) user data.  ii) meta data.
      iii) reports.  iv) indexes.
   c) An online commercial site such as Amazon.com is an example of __________.
      i) Single user database application.
      ii) e-commerce database application.
      iii) datamining database application.
   d) E-R model uses this symbol to represent weak entity set:
      i) dotted rectangle  ii) diamond
      iii) doubly outlined rectangle
   e) Relational algebra is:
      i) DDL  ii) Meta language  iii) Procedural query language
   f) Data model is collection of conceptual tools for describing:
      i) data  ii) data schema
      iii) None  iv) Both i) and ii)
   g) Which database level is closest to the users?
      i) External  ii) Internal
      iii) Physical  iv) Conceptual
   h) What is DBMS?
   i) What is SQL?
   j) What is primary key?
UNIT-IV

Q.8  Write a short note on ‘query processing’ and ‘query optimization’.  

Q.9  Explain the concept of database security and recovery.
Q.1 Answer the following multiple choice questions:

a) The preferred topology for LAN is:
   i) Star  ii) Bus  iii) Ring  iv) Mesh

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

c) It is possible to display pictures (i.e., images) in HTML specification by using the tag:
   i) <GR src = Picture file>  ii) <PIC src = Picture file>
   iii) <IMG src = Picture file>  iv) <GIF src = Picture file>

d) A web page is located using a:

Q.2 a) What do you mean by network? What are various types of network?  

b) Explain email architecture in detail with its block diagram.

Q.3 a) Create a webpage about the course details of a college.
   ABC Information Technology College,
   Course details:
i) Complete course:
   • Basic computer training.
   • Diploma in computer application.

ii) Crash courses:
   • Accounting course.
   • E-banking course.

iii) Other Courses:
   • Secretariat training.
   • Photography training.

For more details: visit abccollege.com (Create a link for abccollege.com)

Q.4 a) Write HTML code in notepad to create following web page:
   i) Create a scrolling text "ICT trends computer operator.
   ii) Display any image in 400 x 300 pixels below the scrolling text.
   iii) Display following text below the image computer generations.
       • First
       • Second
       • Third
       • Fourth

b) Explain all formatting tags with their syntax and semantics used in creating above web page.

Q.5 a) Design the registration form for Manav Rachna International Institute of Research and Studies with the help of tables, forms and CSS. The form must contain the following fields:
   First Name, Last Name, Address, Mobile, Father's Name, E-mail ID Submit and Reset buttons.

b) What are various ways to include css in HTML document

Q.6 a) Write the JavaScript code to create a login page with username and password. The user is given three chances. User should be given an alert message for both right and wrong inputs.

b) Write the source code for the frame divided into 3 rows (20%, 50%, remaining). Divide first row into 3 equal columns and third row into two equal columns. Every frame should have a source file.

Q.7 a) What are various types of dialog box available in JavaScript to interact with user

b) Explain eval(), parseInt() and parseFloat() in JavaScript’s with their syntax and semantics.
End Semester Examination, Dec. 2018
BCA — Third Semester
WEB APPLICATION DEVELOPMENT (BCA-304 (CB))

Time: 3 hrs. Max Marks: 100
No. of pages: 2

Note: Attempt FIVE questions in all; Q.1 is compulsory. Attempt any TWO questions from PART-A and TWO questions from PART-B. Marks are indicated against each question.

Q.1 Answer the following multiple choice questions:
   a) What is the correct syntax of doc. type in HTML5?
      i) <!doctype html> ii) <doctype html!>
      iii) <doctype html> iv) </doctype html>
   b) What if one does not use the doc. type in the starting of HTML document?
      i) Browser finds the document in quirky mode.
      ii) Browser finds a document in standard mode.
      iii) Browser stops working.
      iv) Browser crashes after showing the page.
   c) Which of the following is not the request method?
      i) Head. ii) Get.
      iii) Remove. iv) Put.
   d) What does “3xx” code denote?
      i) Redirection. ii) Server error.
      iii) Success. iv) Informational.
   e) Which of the following is not used with text-decoration property?
      i) Overline. ii) Underline.
      iii) Line-through. iv) Inline.
   f) JavaScript numbers are stored as ___________.
      i) Integers. ii) Double precision floating point.
      iii) Double. iv) Floating point.
   g) Math.random( ) returns ___________.
      i) Random number between 0 and 1.
      ii) Random number between 1 and 10.
      iii) Random number between 1 and 100.
      iv) Random number between 0 and 10.
   h) The integers in JavaScript are precise up to ___________.
      i) 12 digits. ii) 10 digits.
      iii) 23 digits. iv) 15 digits.
   i) JPEG format is useful when ___________.
      i) There are so many colors in the picture.
      ii) There are not so many colors in the picture.
      iii) We want to show more brightness.
      iv) When we want to show haziness.
   j) Vector images are created in ___________.
      iii) Adobe works. iv) Splash-up.

2×10

PART-A

Q.2 a) Explain the term network. What are the different types of networks available? Explain all types of networks in detail with the help of suitable diagram. 10
   b) Describe different types of network topologies in detail. Elaborate your answer with the help of suitable diagram. 10
Q.3  a) Explain email architecture in detail. What are the different protocols in accessing email?  
     b) Differentiate between SMTP and FTP in detail with the help of a suitable example.

Q.4  a) Describe different types of tags of HTML in detail. Mention at least five examples related to 
     HTML tags.  
     b) Mention the difference between ordered and unordered list in detail.

**PART-B**

Q.5  a) Create the following table in HTML with the use of appropriate tags. Enter the data for 5 
     students.

     | Roll No. | Name | Course | Class | Marks |
     |----------|------|--------|-------|-------|

     b) Explain the term Style sheet. What are the different style sheets?

Q.6  a) What are the different operators in JavaScript? Explain all operators in detail.  
     b) Write a Java Script Program which should implement Alert() and Prompt( ) object.

Q.7  Explain the following terms:  
     a) Radio button.  
     b) OnClick event.  
     c) <FRAMESET> tag.  
     d) Combo box.

5×4
Q.1 Write the purpose and use of following commands with their syntax and example.
   a) grep
   b) find
   c) we
   d) umask
   e) ulimit
   f) ln
   g) sort
   h) cd
   i) cut
   j) fseek

   **PART-A**
   
   Q.2 a) Illustrate with a diagram, the typical Unix file system and explain different types of files supported in Unix.  
   b) Differentiate between multitasking and multiuser operating system.

   Q.3 a) Which command is used for listing file attributes? Explain the significance of each field in the output.
   b) Explain absolute and relative methods of assigning permission to the user and files.

   Q.4 a) What do you understand by a link? Differentiate between hard link and soft link.
   b) What is the purpose of grep command? Explain the various options available with the grep command with an example.

   **PART-B**
   
   Q.5 a) What do you mean by pipes and filters? How are these useful in Unix environment? Illustrate through suitable examples.
   b) Write short notes on awk scripts.

   Q.6 a) What do you understand by background process? What are the advantages and disadvantages of running a process in the background?
   b) What is process status? Explain PS command with options.

   Q.7 a) Write a shell script that accepts a number from user and prints the reverse of a number.
   b) Write a shell script that accepts a number from user and prints the factorial of a number.
Q.1  
   a) State “Associative Laws”.
   b) Write the set-builder form of set:
      \[ A = \{a, e, i, o, u\} \]
   c) Define ‘POSETS’.
   d) What do you mean by ‘JOIN’ operator used in lattices?
   e) Explain ‘LHRRWCC’s’.
   f) Explain ‘Slope of Straight Line’.
   g) Give an example of ‘In-to’ function.
   h) DNF stands for __________.
   i) Define an ‘undirected graph’.
   j) Find GCD of (748, 225).

\[ 2 \times 10 \]

**PART-A**

Q.2  
   a) Out of 1200 students at a college, 582 look economics, 627 took English, 543 took Mathematics, 217 took both Economics and English, 307 took both Economics and Mathematics, 250 took both Mathematics and English, 222 took all three subjects. How many took none of the three subjects?  

\[ 10 \]

   b) i) Let R and S be the following relation of \( A = \{1, 2, 3, 4\} \)
      \[ R = \{(2, 3), (1, 3), (1, 4)\}, S = \{(3, 2), (4, 4)\} \]
      Find \( S^2 \circ R^2 \)
      \[ 5 \]
      \[ ii) \]
      Consider the function \( f, g : R \rightarrow R \) defined by
      \[ f(x) = x^2 + 3x + 1 \text{ and } g(x) = 2x - 3 \]
      Find \( (f \circ g) \).

\[ 5 \]

Q.3  
   a) Prove that:
      \[ 1^3 + 2^3 + 3^3 + \cdots + n^3 = \left[ \frac{n(n+1)}{2} \right]^2 \] 
      by the principle of mathematical induction.  

\[ 10 \]

   b) i) State extended pigeonhole principle.
      ii) Find the GCD of 7200 and 3132 by division algorithm.

\[ 5 \]

\[ 5 \]

Q.4  
   a) Define lattices. Explain various types of lattices along with suitable example.

\[ 10 \]

   b) If \( f(x, y, z) = (x \land y) \lor (x \land y^c)^{\frac{1}{2}} \).
      Find its DNF and CNF forms.

\[ 10 \]
Q.5  
   a) Define the following terms:  
      i) Linear Homogeneous Recurrence Relation.  
      ii) Degree of the Recurrence Equation.  
   b) Solve the difference equation  
      \[ a_r - 7a_{r-1} + 10a_{r-2} = 0 \]  
      satisfying the conditions \( a_0 = 0 \) and \( a_1 = 6 \).  

Q.6  
   a) Show that points (3, 2), (0, 5), (−3, 2) and (0, −1) are the vertices of a square.  
   b) Prove that the line joining (6, −4) and (−3, 2) is parallel to the line joining (1, 3) and  
      (−2, 5).  

Q.7  
   a) Write the matrix representation of the given graph and also explain the “Incidence  
      Matrix Representation”.  
   b) Defining spanning trees. Describe the various steps involved to find out a minimum  
      distance spanning tree by using “Krushal’s Algorithm”.  

\[
\begin{align*} 
\begin{tikzpicture} 
  \node (V1) at (0,0) [circle, draw] {$v_1$}; 
  \node (V2) at (2,3) [circle, draw] {$v_2$}; 
  \node (V3) at (2,-3) [circle, draw] {$v_3$}; 
  \node (V4) at (4,0) [circle, draw] {$v_4$}; 
  \node (V5) at (0,3) [circle, draw] {$v_5$}; 
  \node (V6) at (0,-3) [circle, draw] {$v_6$}; 
  \node (V7) at (4,3) [circle, draw] {$v_7$}; 
  \node (V8) at (4,-3) [circle, draw] {$v_8$}; 
  \draw (V1) edge node [above] {$e_1$} (V2); 
  \draw (V1) edge node [right] {$e_2$} (V3); 
  \draw (V2) edge node [above] {$e_3$} (V4); 
  \draw (V3) edge node [right] {$e_4$} (V5); 
  \draw (V4) edge node [below] {$e_5$} (V6); 
  \draw (V5) edge node [left] {$e_6$} (V7); 
  \draw (V6) edge node [below] {$e_7$} (V8); 
  \draw (V7) edge node [right] {$e_8$} (V1); 
\end{tikzpicture}
\end{align*}
\]
Q.1 Answer the following:
   a) Let R be a relation on set \( A = \{k, l, m, n\} \) defined by:
      \[ R = \{(k, l), (m, l), (n, l), (l, l), (k, k), (m, k), (l, k), (n, k)\} \]. Find domain and range of relation R.
   b) Define odd vertex.
   c) Define pigeonhole principle.
   d) Determine the Hasse diagram of the partial order having the directed graph:

   ![Directed Graph]

   e) If \( A = \{1, 2, 3, 4, 5\}; \ B = \{4, 5, 6, 7\} \) find \( A \cup B \).
   f) Find the slope of the line passing through the points (2, 3) and (4, 9).
   g) Find the distance between the points \((-1, 2)\) and \((2, -3)\).
   h) The mid point formula of a line is __________.
   i) Find the equation of a line whose intercepts on axes are 3 and 4.
   j) Find the adjacency matrix \( M = [M_{ij}] \) of the graph given below:

   ![Adjacency Matrix]

   \[ 2 \times 10 \]

Q.2 a) In a class of 60 boys, there are 45 boys who play hockey and 30 boys, who play football, find:
   i) How many boys play hockey only?
   ii) How many boys play football only?
   b) How many people atleast in a group of 85 people have the same last initials?

Q.3 a) Show that the set \( A = \{2, 3, 4, 6\} \) is not a lattice with the relation of divisibility. Also, draw the Hasse diagram of the poset A.
   b) If \( f(x) = x^2, g(x) = x + 5, x \in \mathbb{R} \). Then find the composition fog and gof.
Q.4  a) Let P and Q be the relations on set \( A = \{1, 2, 3, 4\} \) defined by:
\[
P = \{(1, 2), (2, 2), (2, 3), (2, 4), (3, 2), (4, 2), (4, 3)\}
\[
Q = \{(2, 2), (2, 3), (3, 2), (3, 3), (3, 4), (4, 1), (4, 2)\}
\]
Find POP and POQ  

b) Find the gcd of 858 and 325 and express \( d = m \cdot 858 + n \cdot 325 \), where \( d \) is gcd of 858 and 325 and \( m \) and \( n \) are integers.

\[
\text{PART-B}
\]

Q.5  a) Write the adjacency matrix of the directed graph given below:

b) Find the complement of the following graph given below:

Q.6  a) Find the equation of a line passing through the point (2,1) and parallel to the line joining the points (1,3) and (-3,1).

b) Find a minimal spanning tree for the graph given below:
Q.7  

a) Solve the recurrence relation:
\[ a_r - 7a_{r-1} + 10a_{r-2} = 0 \]  
given that \( a_0 = 0, \ a_1 = 3 \)

b) Find the equation of line passing through the points (1,2) and (0,5).
Q.1 Answer the following:

a) If C={6, 6, 7, 8, 9}; D={1, 3, 5, 7, 9} evaluate \((C \cap D)\).

b) Consider the relation R from X to Y 
   \[X = \{1, 2, 3\}; Y = \{8, 9\}; R = \{(1, 8), (2, 8), (3, 9)\}\] find the complement of relation R.

c) Let A={2,3,4} and B={a,b,c} and \(f=\{(2,a),(3,b),(4,b)\}\) find domain, codomain and range of the function.

d) Define pendent vertex.

e) Seven members of a family have total Rs. 2886/- in their pockets. Show that at least one of them must have at least 413 in his pockets.

f) Draw the directed graph of relation determined by the Hasse diagram on the set 
   \(A=\{1,4,6,8\}\).

\[\begin{align*}
&1 \\
& \downarrow \\
& 3 \\
& \searrow \\
& 6 \\
& \nearrow \\
& 8 \\
& \leftarrow \\
& 2
\end{align*}\]

g) Consider the undirected graph G given below. Find its incidence matrix.

\[\begin{align*}
V_1 & \quad e_1 & \quad V_2 \\
V_2 & \quad e_2 & \quad V_3 \\
V_3 & \quad e_4 & \quad V_1 \\
V_1 & \quad e_5 & \quad V_3 \\
V_3 & \quad e_3 & \quad V_2
\end{align*}\]

h) Consider the directed graph given below. Find the indeg and outdeg of each vertex of a graph.

\[\begin{align*}
&1 \\
& \downarrow \\
& 2 \\
& \searrow \\
& 3
\end{align*}\]

i) The equation of line in intercept form ___________.

j) Formula for evaluating in the angle between two lines is ________. 2×10
PART-A

Q.2 a) Let $X=\{1,2,3,4,5\}$ and $Y=\{1,2,5,6,7,9,10,11,12,13,14\}$ Find the function defined by $f(x) = 2x + 3$. Also find the domain and range.

b) Prove that $1 + 3 + 5 + \ldots + (2n - 1) = n^2$ by mathematical induction.

Q.3 a) Let $D_{10}$ be the set of all positive factors of 10, then prove that $D_{10}$ forms a lattice with the relation of divisibility. Also, draw the Hasse diagram of the lattice $D_{10}$.

b) In a class of 25 students, 12 students have taken economics; 8 have taken economics but not maths. Find i) in number of students who have taken economics and maths ii) those who have taken maths but not economics.

Q.4 a) If the map $f : \mathbb{R} \to \mathbb{R}$ is given by $f(x) = 4x - 1$ and the map $g : \mathbb{R} \to \mathbb{R}$ is given by $g(x) = x^3 + 2$, find $f \circ g$ and $g \circ f$.

b) Find the values of $m$ and $n$ if $\gcd(595, 252) = 252m + 595n$.

PART-B

Q.5 a) Solve the difference equation:

$$a_r - 7a_{r-1} + 10a_{r-2} = 0$$

satisfying the conditions $a_0 = 0$ and $a_1 = 6$.

b) Find the equation of the line passing through (4,5) and perpendicular to $4x - 3y + 7 = 0$.

Q.6 a) If the points (3,3), (1,k) and (2,0) are collinear find $k$.

b) Construct a minimum spanning tree for the given weighted graph:

Q.7 a) Draw the undirected complete graph $K_5$.

b) Draw the multigraph $G$ whose adjacency matrix $M_A$ is show below:

$$M_A = \begin{bmatrix}
1 & 3 & 0 & 0 \\
3 & 0 & 1 & 1 \\
0 & 1 & 2 & 2 \\
0 & 1 & 2 & 0
\end{bmatrix}$$

C) Give an example of a graph which has an Euler circuit but not a Hamiltonian circuit.
Q.1 Multiple choice questions:
   a) Exception generated in try block is caught in _________ block
      i) Catch ii) Throw
      iii) Throws iv) Finally
      v) None of these
   b) Which of the following is a method having same name as that of its class?
      i) Finalize ii) Delete
      iii) Class iv) Constructor
      v) None of these
   c) Which of these operators can skip evaluating right hand operand?
      i) ! ii) &
      iii) None of these iv) &&
   d) Which keyword is used to refer to member of base class from subclass?
      i) Upper ii) Super
      iii) This iv) None of these
   e) Which method can be used to output a string in an applet?
      i) Display (   ) ii) Drawstring(   )
      iii) Print(   ) iv) None of these

State whether the following statements are TRUE or FALSE:
   f) An abstract class can be used as a data type.
   g) Package is a mechanism for naming and visibility control of a class and its content.
   h) Java is a moderate typed language.
   i) Switch statement in Java in multi-way branch statement.
   j) Define class.

PART-A

Q.2
   a) Discuss five features of Java.
   b) Write short note on data types.
   c) Write short note on type casting.

Q.3
   a) Write a program in Java to check whether given number is palindrome or not.
   b) Give the syntax, purpose and example of switch statement.

Q.4
   a) What is Inheritance? Discuss various types of inheritance. Give example of each.
   b) Write short note on interface.

PART-B

Q.5
   a) What is difference between string and string buffer class?
   b) Explain checked and unchecked exceptions.
c) Discuss various levels of access protection available for packages. 7½

Q.6  
a) How do applets differ from application programs? 5

b) Discuss:
   i) <PARAM> tag
   ii) <APPLET> tage 5×2

c) Why do applet classes need to be declared as public? 5

Q.7 Write short note on adapter classes and AWT controls. 20
Q.1 a) Interactive computer graphics uses various kinds of input devices such as:
   i) Mouse   ii) Graphic tablet
   iii) Joystick   iv) All of these.
b) CAD means:
   i) Car Aided Design   ii) Computer Art Design
   iii) Computer Aided Design   iv) None of these.
c) A basic interactive picture construction technique are:
   i) Positioning and pointing, constraints
   ii) Grid, gravity field, rubber band method
   iii) Sketching, drawing, inking and painting
   iv) All of these.
d) The division displayed on screen into row and columns is known as:
   i) Rubber band method   ii) Gravity field
   iii) Dragging   iv) Grid
e) Joysticks are often used to control:
   i) Typing   ii) Video games
   iii) Voice   iv) None of these.
f) The transformation in which the dimension of an object are changed relative to a fixed point is called:
   i) Translation.   ii) Scaling.
   iii) Rotation.   iv) Reflection.
g) Example of morphing are:
   i) Oil takes the shape of a car   ii) A tiger turns into a bike
   iii) Both i) and ii)   iv) None of these.
h) Some common forms of clipping include:
   i) Curve clipping   ii) Point clipping
   iii) Polygon clipping   iv) All of these.
i) The types of parallel projection are:
   i) Orthographic projection and quadric projection
   ii) Orthographic projection and oblique projection
   iii) Oblique projection and quadric projection
   iv) None of these.
j) The text colour in a presentation should contrast with the ______ colour:
   i) CPU   ii) Frame
   iii) Stack   iv) Background

PART-A

Q.2 a) What do you mean by computer graphics? Explain its applications. 10
b) What are the different methods of generating colour in CRT? Explain. 10

Q.3 a) Explain Bresenhem’s line drawing algorithm with an example. 10
b) Explain any five techniques of interactive graphics. 10
Q.4  a) What do you mean by transformation matrix? Explain in details.  
    b) Perform three unit uniform scaling on a given triangle A(1,1), B(5,8) & C(9,8).  

    PART-B

Q.5  a) How three dimensional objects are different from 2 dimensional objects? Explain 
      through some example.  
    b) Explain different type of transformations in details.  

Q.6  a) What do you understand by window to viewport mapping? Explain with the help of a 
      diagram.  
    b) What do you mean by clipping? Explain different type of clipping with the help of 
      example.  

Q.7  a) What is the role of animation in daily life? Explain with the help of examples.  
    b) Explain the following:  
       i) Key frame specification.  
       ii) Flip Book.  
       iii) Animator Mask.  
       iv) Morphing.
Q.1 Answer the following:
   a) Who writes the SRS documents?
      i) Developer  ii) Tester  iii) Analyst  iv) None of these.
   b) Which of the following not a phase of prototyping model?
      i) Quick design  ii) Coding  iii) Prototype refinement  iv) Engineer product.
   c) RAD Model has:
      i) 2 phases  ii) 3 phases  iii) 5 phases  iv) 6 phases
   d) The model in system modeling depicts the dynamic behavior of the system?
      i) Content model  ii) Behavioral Model  iii) Data model  iv) Object model.
   e) In design phase, which is primary area of concern?
      i) Architecture  ii) Data  iii) Interface  iv) All of the above.
   f) What leads to failure of a software?
      i) Errors  ii) Bugs  iii) Fault  iv) All of the above.
   g) To define the strength of a architecture of software, which one is suitable?
      i) High cohesion, low coupling  ii) Low cohesion, low coupling.
      iii) High cohesion, high coupling  iv) Low cohesion, high coupling.
   h) RAD Stands for ________________.
   i) SRS stands for ________________.
   j) Site for alpha testing is: Software company / installation place. 1x10
   k) Debugging is ________________.
   l) In DFDs, user interactions with the system are denoted by ________________.
   m) SPIRAL model has user involvement in all the phases. (TRUE / FALSE)
   n) Actual programming of software code is done during the ______ step in SDLC.
   o) What is Gantt chart? 2x5

PART-A

Q.2  a) Why software engineering is significant in developing a software? What is the aim of software engineering? What are the major differences between software engineering and other traditional engineering disciplines? 10
   b) List the situation where we can use RAD model for software development? Also explain each phase of RAD model in detail. 10

Q.3  Consider the problem of railway reservation system and design the following:
   a) Problem statement  b) Level-O-DFD  c) Level-1 DFD  c) ER-Diagram 5x4

Q.4  a) An application has the following:
10 low external inputs, 12 high external outputs, 20 low internal logical files, 15 high external interface files, 12 average external inquiries, and a value of complexity adjustment factor of 1.10. What are the unadjusted and adjusted function point counts?

b) Suppose that a project was estimated to be 400 KLOC. Calculate the effort and development time for each of the three modes i.e. organic, semi-conducted and embedded.

**PART-B**

Q.5  
   a) Explain the design guidelines that can be used to produce “Good quality” software design.  
   b) What problems are likely to arise if two modules have high coupling? Discuss all types of coupling?

Q.6  
Consider a program for determination of the nature of roots of a quadratic equation. Its input is a triple of positive integers (a, b, c) and values may be from interval (0,100). The program output may have one of the following words: (Not a quadratic equation, real roots, imaginary roots, equal roots) Design test cases by following functional testing methods:  
   a) Boundary value analysis  
   b) Equivalence class testing.

Q.7  
Write short notes on:  
   a) Software reliability.  
   b) Software configuration Management.  
   c) Software Maintenance.  
   d) Alpha-Beta testing.
Q.1 Multiple choices questions/short answer questions:
   a) Repeater is used to ________.
   b) The amount of data that can be carried from one point to another in a given line period is called ____________.
   c) The pulse rate is always _________ the bit rate.
      i) Greater than ii) Less than
      iii) Greater than or equal to iv) Less than or equal to
   d) A cable break in a ________ topology stops all transmission.
      i) Mesh ii) Bus
      iii) Star iv) Primary
   e) ICMP stand for ________.
   f) Find the net id and host id of the given IP address: 129.14.16.8
   g) Full duplex is ________.
   h) Compute the band rate for a 72,000 bps, 64 QAM signal.
      i) 12000 baud ii) 10,000 baud
      iii) 8000 baud iv) 18,000 baud
   i) A DNS _______ server gets it data from another DNS server.
      i) Primary ii) Secondary
      iii) Root iv) All of the above
   j) ________ encoding has a transition at the middle of each bit.
      i) RZ ii) Manchester
      iii) Differential Manchester iv) All of the above.

PART-A

Q.2 a) In analog transmission how analog to digital conversion takes place? Explain with the help of a suitable diagram. 10
    b) What is data communication? Identify the main components of data communication system. 10

Q.3 a) How do the layers of TCP/IP protocol suite correlate to the layer of OSI model? Discuss. 10
    b) Write short notes on:
      i) Cyclic redundancy check in error detection.
      ii) Parity check. 5x2

Q.4 a) What is the purpose of hamming code? How can we use the hamming code to correct a burst error? 10
    b) Given a bit pattern 101110001, encode the bit using the following encoding scheme: RZ, NRZ (L), NRZ(I), Manchester encoding. 10

PART-B

Q.5 Write short noes on:
   a) Bluetooth. b) Virtual LAN
   c) Frame relay d) ATM 5x4
Q.6  
   a) How handshaking is done by TCP? Explain the TCP packet format in detail.  
   b) How communication can achieved from one point on the earth to another? Justify you answer.  

Q.7  
   a) Explain IPV6 addressing mechanism in detail.  
   b) What is VLAN? How does VLAN provide extra security for a network?
Q.1 Multiple choice questions:

a) Most packet switches use this principle:
   i) Stop and wait
   ii) Store and forward
   iii) Both Stop and wait and Store and forward
   iv) None of the mentioned

b) In _________ resources are allocated on demand.
   i) packet switching
   ii) circuit switching
   iii) line switching
   iv) frequency switching

c) In IPv4 Addresses, classful addressing is replaced with:
   i) Classless Addressing
   ii) Classful Addressing
   iii) Classful Advertising
   iv) Classless Advertising

d) ATM uses the
   i) asynchronous frequency division multiplexing
   ii) asynchronous time division multiplexing
   iii) asynchronous space division multiplexing
   iv) none of the mentioned

e) Frame relay has error detection at the
   i) physical layer
   ii) data link layer
   iii) network layer
   iv) transport layer

f) Two broad categories of congestion control are:
   i) Open-loop and Closed-loop
   ii) Open-control and Closed-control
   iii) Active control and Passive control
   iv) None of the mentioned

g) Two devices are in network if
   i) a process in one device is able to exchange information with a process in another device.
   ii) a process is running on both devices.
   iii) PIDs of the processes running of different devices are same.
   iv) none of the mentioned

h) In the layer hierarchy as the data packet moves from the upper to the lower layers, headers are:
   i) Added
   ii) Removed
   iii) Rearranged
   iv) Modified

i) Physical layer provides:
   i) Mechanical specifications of electrical connectors and cables.
   ii) Electrical specification of transmission line signal level.
   iii) Specification for IR over optical fiber
   iv) all of the mentioned

j) Application layer offers _________ service.
   i) End to end.
   ii) Process to process.
   iii) Both End to end and Process to process.
   iv) None of the mentioned.

Write short note of following:
k) Framing.
l) Bluetooth technology.  

**PART-A**

Q.2 a) How topologies help in setting a network. Explain any 5 topologies with the help of a diagram.  

b) What do you mean by data communication? Explain its components and characteristics of data communication.  

Q.3 a) Explain different type of switching techniques.  

b) Write short notes on following:  
   i) Cable TV Networks.  
   ii) Guided and Unguided Medium.  

Q.4 a) Explain TCP/IP model. How it is different from OSI model. Explain.  

b) Data is transmitted as 1011110 and received as 1011100. Using haming code detects the error and gives method for obtaining correct sequence.  

**PART-B**

Q.5 a) Differentiate between:  
   i) IPV4 and IPV6.  

b) Write short notes on following:  
   i) User Datagram Protocol.  
   ii) Congestion Control.  

Q.6 Explain token bus. How token is being passed in token ring architecture. Also explain the frame format of the token bus.  

Q.7 Write short notes on following:  
   a) ALOHA.  
   b) Frame Relay.  
   c) CSMA/CD.  
   d) Standard Ethernet
Q.1 Answer the following multiple choice questions:

a) Correct Declaration of Values to variables 'a' and 'b'?
   i) int a = 32, b = 40.6;  ii) int a = 42, b = 40;
   iii) int a = 32, int b = 40;  iv) int a = b = 42;

b) Which Conversion function of 'Convert.ToInt32()' and 'Int32.Parse()' is efficient?
   Int32.Parse() is only used for strings and throws argument exception for null string.
   Convert.ToInt32() used for data types and returns directly '0' for null string
   i) 2  ii) Both 1, 2
   iii) 1  iv) None of the mentioned

c) Default Type of number without decimal is?
   i) Long Int  ii) Unsigned Long
   iii) Int  iv) Unsigned Int

d) Scope of variable is related to definition of variable as:
   Region of code within which variable value is valid and hence can be accessed.
   No, relation with region where variable is declared its value is valid in entire scope.
   i) a  ii) b
   iii) a, b  iv) None of the mentioned

e) What is the process of defining a method in terms of itself, that is a method that calls itself?
   i) Polymorphism  ii) Abstraction
   iii) Encapsulation  iv) Recursion

f) The capability of an object in C# to take number of different forms and hence display behavior as according is known as:
   i) Encapsulation  ii) Polymorphism
   iii) Abstraction  iv) None of the mentioned

g) In Inheritance concept, which of the following members of base class are accessible to derived class members?
   i) static  ii) protected
   iii) private  iv) shared

h) Which of these method of class string is used to obtain length of string object?
   i) get(    )  ii) sizeof(    )
   iii) Lengthof(    )  iv) Length(    )

i) Select the wrong statement about 'ref' keyword in C#?
   i) References can be called recursively.
   ii) The 'ref keyword causes arguments to be passed by reference.
   iii) When 'ref' are used, any changes made to parameters in method will be reflected in variable when control is passed back to calling method.
   iv) All of above mentioned.

j) Which of following statements are correct about functions?
   i) C# allows a function to have arguments with default values.
   ii) Redefining a method parameter in the method's body causes an exception.
   iii) C# allows function to have arguments with default values.
PART-A
Q.2  a) Explain .Net framework with all its associated class libraries in detail.  
     b) What are the different .Net framework components? Explain at least 5 components in detail.

Q.3  a) Elaborate the concept of Integrated Development Environment (IDE). How it is helpful to create a strong user interface? Explain.  
     b) What are the different data types available in C#? Explain at least 5 data types in detail with the help of example.

Q.4  a) Differentiate between server explorer and windows explorer in detail.  
     b) Explain the difference between variable and constant in detail.

PART-B
Q.5  ADO .Net plays an important role in accessing the data from the database in C#. Explain the different components to be used with ADO .NET in detail.

Q.6  a) Differentiate between polymorphism and encapsulation in detail with the help of suitable diagram.  
     b) What are the different ways to view the data from the database? Explain each in detail with the help of suitable example.

Q.7  Explain in detail the following:  
     a) Dataprovider(   )  
     b) List Box  
     c) Popup Menu  
     d) Timer Control  
     e) Rich Text Box  

iv) Omitting the return type in method definition results into exception.  2×10
Q.1 Answer the following questions:
   a) Name any two RDBMS packages used in market now a days.
   b) Explain “like” operator in SQL with suitable example.
   c) What is user defined exception?
   d) Write the syntax for “Upper” and “Lower” character function in SQL.
   e) Explain any two group function of SQL with proper syntax.
   f) Define “Transaction”.
   g) What is serial and concurrent execution of transaction?
   h) Give a real life example two describe deadlock. Relate it with transaction execution.
   i) Name any two reasons for system failure.
   j) Justify that backup is necessary for efficient functionality of databases.

Q.2 Write short notes on following with example:
   a) Wild card characters. (%, _(underscore))
   b) Order by clause.
   c) SUM, AVERAGE, MAX, MIN functions.
   d) IN, BETWEEN, LIKE operators.

Q.3 Differentiate between stored procedures and local procedures. Write the syntax for stored and local procedure and explain them with example.

Q.4 What is meant by transaction? Explain with suitable example the read, write operations of transaction. Also, comment how does DBMS ensure that the transactions are executed properly?

Q.5 What are the different approaches used by concurrency control algorithms? Explain two-phase locking protocol with suitable example.

Q.6 a) What is data tempering?
   b) Explain various causes of system failure with example.

Q.7 What is the importance of recovery procedure? How it is achieved? Explain different recovery techniques with its advantages and disadvantages.
End Semester Examination, Dec. 2018  
BCA – Fifth Semester  
COMPUTER GRAPHICS (BCA-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. Marks are indicated against each question.

Q.1 a) Write short notes on the following:  
   i) Graphic standards.  ii) GUI and CUI.  
   iii) Plotter.  iv) Window.  
   v) Clipping of objects.  vi) Point, line and polygon.  
   vii) Flood fill algorithm.  viii) Data glove.  
      1½ × 8  

b) Answer the following questions:  
   i) Define homogeneous co-ordinates for translation.  
   ii) Define 2D transformations and its types.  
      1½ × 2  

UNIT-I

Q.2 What is computer graphics? Discuss the advantages of interactive computer graphics in our day to day life.  
         15

Q.3 Differentiate between Random-scan system and Roaster-Scan system. Explain the functionality of CRT with proper diagram.  
         15

UNIT-II

Q.4 a) Differentiate between Bresenham and DDA algorithm for line drawing.  
   b) Consider the line co-ordinates A(2, 4) and B(9, 9). Plot the line between coordinates using DDA algorithm.  
      8  
      7

Q.5 a) Consider the co-ordinates of a triangle A(2, 2), B(5, 2) and C(5, 2). Translate the triangle by 3 units in x-axis and 2 units in y-axis using homogeneous co-ordinate representation.  
   b) Write down the geometric representation of scaling in homogenous co-ordinates. Consider the triangle (A(0, 3), B(1, 4) and C(0, 5) and scale the triangle by double of its size.  
      8  
      7

UNIT-III

Q.6 Write the basic definitions of the sub-classes of parallel projection.  
         15

Q.7 Define the following:  
   a) Window.  
   b) Viewport.  
   c) Window to view port mapping.  
      5 × 3

UNIT-IV

Q.8 Explain the following functions used in graphics:  
   a) Set bk color.  b) Set color.  c) Initgraph.  
   d) Clear device.  e) Close graph.  
      3 × 5
Q.9 Explain various graphics drivers and graphics modes used for displaying graphic images.
End Semester Examination, Dec. 2018  
BCA – Fifth Semester  
RDBMS USING ORACLE (BCA-503A (CB))

Time: 3 hrs.  Max Marks: 100  
No. of pages: 2

Note: Attempt FIVE questions in all; Q.1 is compulsory. Attempt any TWO questions from PART-A and TWO questions from PART-B. Marks are indicated against each question.

Q.1 a) Duplicate data is referred as ___________ data:
   i) Accurate  ii) Redundant
   iii) Storage  iv) None of these

b) A command to remove a relation from an SQL database:
   i) Delete  ii) Drop
   iii) Erase  iv) Alter

c) Which of the following is not a valid relational database?
   i) SYBASE  ii) Oracle
   iii) Foxpro  iv) UNIFY

d) In a relational schema, each tuple is divided into fields called:
   i) Relations  ii) Domain
   iii) Queries  iv) None of these

e) Which of the following is based on multi-valued dependency?
   i) 1NF  ii) 2NF
   iii) 3NF  iv) 4NF

f) An entity in A is associated with any number of entities in B, however an entity in B is associated with almost one entity in A.
   i) One-to-one  ii) One-to-many
   iii) Many-to-many  iv) None of these

g) Give the full form of DDBMS.

h) A PL/SQL statement is terminated with:
   i) END  ii) STOP
   iii) BREAK  iv) None of these

i) What are the following ways to handle errors?
   i) Trap  ii) Propagate
   iii) Both  iv) None of these

j) Define BCNF.  

PART-A

Q.2 Discuss the following with suitable examples:
   a) Functional dependency.
   b) Partial dependency.
   c) Transitive dependency.
   d) Multi-valued dependency.
   e) Trivial dependency.  

Q.3 Explain the database architecture in context to oracle database with help of suitable diagram. Also, elaborate the differences between the RDBMS and ORDBMS architecture.

Q.4 Discuss the syntax, purpose and example of following:
   a) Equijoin  b) Order by
   c) Intersect  d) Minus
Q.5  
a) Discuss various data types available in PL/SQL. Give example of each.  
   
b) Write a short note on ‘database triggers’.  

Q.6  
a) What are subprograms? Write the advantages of subprograms. Differentiate  
   between ‘procedure’ and ‘function’.  

b) How can we drop the existing function, procedure and package?  

Q.7  
a) What problems will occur due to concurrent execution of two transactions? What are  
   their solutions?  

b) Discuss locking techniques with example.
Q.1 a) Define the following:
   i) Transcendental equation.
   ii) Interpolation.
   iii) Bisection method.
   iv) Absolute error.
   v) Rule 1 of absolute error because of truncation.

d) The root of the equation \( x^2 - 2x - 5 = 0 \) lies between __________.

e) What is probability?

f) The mean and variance of binomial distribution is __________ and ______.

g) The lagrange’s interpolation formula is used for the arguments which are ______ spaced.

h) Order of convergence of false position method is __________.  

UNIT-I

Q.2 a) Find by Newton-Raphson method, the real root of equation \( 3x = \cos x + 1 \) correct to four decimal place.  

b) Evaluate \( \int_{0}^{0.1} \frac{2\,dx}{1+x} \) by simpson’s \( \frac{1}{3} \)rd rule.  

Q.3 a) Use Taylor’s series method to solve \( \frac{dy}{dx} = x + y; \ y(1) = 0 \) numerically upto \( x = 1.2 \) with \( h = 0.1 \) compare the final result with the value of explicit solution.  

b) Explain various steps of Bisection method.  

UNIT-II

Q.4 From the following table of values of X and \( f(x) \), determine:

<table>
<thead>
<tr>
<th>X</th>
<th>0.20</th>
<th>0.22</th>
<th>0.24</th>
<th>0.26</th>
<th>0.28</th>
<th>0.30</th>
</tr>
</thead>
<tbody>
<tr>
<td>y</td>
<td>1.6596</td>
<td>1.6698</td>
<td>1.6804</td>
<td>1.6912</td>
<td>1.7024</td>
<td>1.7139</td>
</tr>
</tbody>
</table>

Q.5 Solve the equation \( \frac{dy}{dx} = x + y \) with initial condition \( y(0) = 1 \), by Runge Kutta rule from \( x = 0 \) to \( x = 0.4 \) with \( h = 0.1 \).

UNIT-III

Q.6 By the method of least square find the straight line that best fits the following data:

<table>
<thead>
<tr>
<th>X</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
</table>
Q.7 Explain the following method:
   a) Trapezoidal rule.
   b) Simpson’s \( \frac{1}{3} \) rule.
   c) Simpson’s \( \frac{3}{8} \) rule.

Q.8 Write short notes on:
   a) Level of significance.
   b) Type 1 error.
   c) Types of sampling.

Q.9 a) A coin was flipped for 10 times, and the head came up 8 times. Test the hypothesis at 95% level of confidence that the coin was not imbalanced.
   b) What do you mean by hypothesis testing? Explain in detail.
Q.1 Answer the following questions:

a) Which is not the commonly used programming language for AI?
   i) PROLOG  ii) java  iii) LISP  iv) PERL

b) Which search method takes less memory?
   i) Depth-First Search  ii) Breadth-First Search
   iii) Both (a) & (b)  iv) Liner Search

c) A* Algorithm is based on:
   i) Breath-First Search  ii) Depth-First Search
   iii) Best-First Search  iv) Hill Climbing
   v) Bulk world Problem.

d) Neural networks are complex __________ with many parameters:
   i) Linear Functions  ii) Nonlinear Functions
   iii) Discrete Functions  iv) Exponential Functions
   v) Power Functions.

e) A perceptron is a ____________
   i) Feed-Forward Neural Network  ii) Back-Propagation Algorithm
   iii) Back-Tracking Algorithm  iv) Feed-Forward-Backward Algorithm
   v) Optimal Algorithm With Dynamic Programming.

f) What is Cybernetics?
   i) Study of communication between two machines
   ii) Study of communication between human and machine
   iii) Study of communication between two humans
   iv) Study of Boolean Values.

g) An Algorithm is complete if:
   i) It terminates with a solution when one exists  ii) It starts with a solution
   iii) It does not terminate with a solution  iv) It has a loop
   v) It has a decision parameter.

h) Consider a good system for the representation of knowledge in a particular domain. What property should it possess?
   i) Representational Adequacy  ii) Inferential Adequacy
   iii) Inferential Efficiency  iv) Acquisitional Efficiency
   v) All the above.

i) In Bay’s theorem, what is the meant by P(Hi)(E)?
   i) The probability that hypotheses Hi is true given evidence E
   ii) The probability that hypotheses Hi is false given evidence E
   iii) The probability that hypotheses Hi is true given false evidence E
   iv) The probability that hypotheses Hi is false given false evidence E
   v) The probability that hypotheses Hi is true given unexpected evidence E

j) Which of the following is true related to ‘satisfiable’ property?
   i) A statement is satisfiable if there is some interpretation for which it is false.
   ii) A statement is satisfiable if there is some interpretation for which it is true.
   iii) A statement is satisfiable if there is no interpretation for which it is true.
   iv) A statement is satisfiable if there is no interpretation for which it is false.
PART-A

Q.2 Consider the water jug problem as stated here: “You are given two jugs, a 4 gallon one and a 3 gallon one. Neither has any measuring marker on it. There is a pump that can be used to fill the jugs with water. How can you exactly 2 gallons of water into the 4 gallon jug? Represent this as a problem in state space search and state its production rules. Show at least one solution to this problem.

Q.3 a) Explain inference rules in propositional calculus by taking suitable examples.
   b) Determine whether the following is satisfiable, contradictory or valid: \((x \lor y) \lor (x \land y)\) The hardware alone can’t perform any particular calculation or manipulation without being instructed exactly. What are these instructions known as? Define them and give their classification too.

Q.4 Differentiate between ‘blind search’ and ‘heuristic search’ techniques. Discuss any heuristic search technique by stating its algorithm along with an example.

PART-B

Q.5 Consider the following sentences:
   a) Raj likes all kinds of food.
   b) Apples are food.
   c) Anything anyone eats and isn’t killed by is food.
   d) Sachin eats peanuts and is still alive.
   e) Vinod eats everything sachin eats.
   Translate these sentences into formulas in predicate logic.

Q.6 Define ‘expert system’. What are the applications of an expert system? Name any two expert system which are used in the area of disease diagnosis. Discuss the architecture of an experts system.

Q.7 Discuss the following:
   a) Procedural and Declarative knowledge
   b) Fuzzy logic
   c) Forward and backward reasoning
   d) Neural Network.
Q.1  a) What do you understand by an AI technique?
    b) Define 'knowledge'. Discuss various types of knowledge.
    c) Draw knowledge pyramid.
    d) Discuss Need of heuristic functions.
    e) Give an example of declarative knowledge?
    f) What is a fuzzy set? Give example.
    g) Define expert system?
    h) Which forward chaining is different from backward chaining inference method?
    i) Which blind search algorithm takes less memory (DFS/BFS)? Mention its space complexity also.
    j) Give an example where modus ponen rule can be applied.

    2×10

PART-A

Q.2  a) Which of the following search algorithms are complete and which are optimal?
    • C = complete but not optimal
    • O = optimal but not complete
    • B = both complete and optimal
    • N = neither complete nor optimal
    i) breadth-first search
    ii) depth-first search
    iii) Best first search
    iv) Hill Climbing search

    10

    b) Explain the State Space with the use of 8 Puzzle Problem.

    10

Q.3  Explain major Inference Rules in Propositional Calculus with the help of suitable examples.

    20

Q.4  Consider the following sentences:
    a) Tennis is a game. Chess is a game.
    b) John and Steve are students.
    c) John plays Tennis.
    d) Steve plays everything that John plays.
    e) Students who play Tennis, do not play Chess.
    Translate the above sentences into formulas in Predicate logic.

    20

PART-B

Q.5  Consider the following inference: Given the rules and facts,
    Rules:-
    R1: If X is a close relative of Y and Y is a close relative of Z then X is acquainted with Z.
    R2: If X is a parent of Y, then X is a close relative of Y.
    R3: If X is married to Y, then X is a close relative of Y.
    Fact:-
    F1:   Sam is a parent of Mike.
    F2:   Mike is married to Alice.
    Infer that Sam is acquainted with Alice using either forward or backward chaining.

    20

Q.6  Explain followings with reference to expert system:
    a) Expert system shell.
    b) Knowledge acquisition.

    10×2
Q.7 Discuss following:
   a) Procedural and Declarative knowledge.
   b) Fuzzy logic.
   c) Machine Learning.
   d) Neural Network.
Q.1 Answer the following multiple choice questions:
   a) Which of the following command will create a list:
      i) list1 = list ( )  
      ii) list1 = [ ] 
      iii) list1 = list([1, 2, 3])  
      iv) all of the mentioned
   b) Which of the following is not a keyword?
      i) eval 
      ii) assert 
      iii) nonlocal 
      iv) pass
   c) Which of the following is an invalid statement?
      i) abc = 1,000,000
      ii) abc = 1000 2000 3000
      iii) a,b,c = 1000, 2000, 3000
      iv) a_b_c = 1,000,000
   d) Mathematical operations can be performed on a string. State whether true or false.
      i) True  
      ii) False
   e) What error occurs when you execute?
      apple = mango
      i) SyntaxError 
      ii) NameError 
      iii) ValueError 
      iv) TypeError
   f) In order to store values in terms of key and value we use what core data type:
      i) list 
      ii) tuple 
      iii) class 
      iv) dictionary
   g) How many except statements can a try-except block have?
      i) zero. 
      ii) one 
      iii) more than one. 
      iv) more than zero
   h) Given a string example – “hello” what is the output of example.count(l):
      i) 2 
      ii) 1 
      iii) None 
      iv) 0
   i) What is the output of the function complex ( )?
      i) 0j 
      ii) 0+0j 
      iii) 0 
      iv) Error
   j) Which of the following statements create a dictionary?
      i) d = {}
      ii) d = {“john”:40, “peter”:45}
      iii) d = {40:”john”, 45 ”peter”}
      iv) All of the mentioned.

PART-A

Q.2 a) Explain the term data structure. How different types of data structures are used in python. Explain at least 2 data structures with the help of suitable examples. 
   b) Differentiate between for loop and while loop with the help of flow of their execution and at least two programs of each loop.

Q.3 a) Describe Exception Handling in Python. How exception are raised and handled in the program. Explain your answer with the help of suitable example.
b) Define “Function”. What are steps involved in using the function. Also, state the difference between pass by value and pass by reference with the help of program.  

Q.4  
a) Differentiate between the global and local variables in python. Explain your answer with the help of suitable example.  
b) Write a program that accepts a comma separated sequence of words as input and prints the unique words in sorted form (alphanumerically).

PART-B

Q.5  
a) With the help of example explain the concept of class methods and static methods in detail.  
b) According to your point of view what differences you have observed when the class variable is mutable and immutable type.

Q.6  
a) Mention the advantages of using Python over any other programming language in context to current scenario's programming approach.  
b) Different at least 10 string functions to be used in Python. How these functions are helpful in managing the string for the complex programs.

Q.7 Explain the following terms:  
a) Variable scope.  
b) Modules.  
c) Dictionary.  
d) Except.
End Semester Examination, Dec. 2018
BCA – Sixth Semester
PROGRAMMING IN C# (BCA-602 (CB))

Time: 3 hrs. Max Marks: 100
No. of pages: 2

Note: Attempt FIVE questions in all; Q.1 is compulsory. Attempt any TWO questions from Part-A and TWO questions from Part-B. Marks are indicated against each question.

Q.1 Multiple choice question:

a) Which string method is used to compare two strings with each other?
   i) Compare to( ) ii) Compare
   iii) Copy iv) Concat( )

b) Which keyword is used to refer baseclass constructor to subclass constructor
   i) This ii) Static
   iii) Base iv) Extend

c) Which statement is correct about constructions in C# .NET?
   i) A constructor cannot be declared as private
   ii) A constructor cannot be overloaded.
   iii) A constructor can be a static constructor.
   iv) None of the above.

d) Which operator is used to access the member function of a class?
   i) : ii) ::
   iii) . iv) #

e) The data members of a class by default are?
   i) Protected, public ii) Private, public
   iii) Private iv) Public

f) Which of the following statements are correct about functions?
   i) C# allows a function to have arguments with default values.
   ii) Redefining a method parameter in the method’s body causes an exception.
   iii) C# allows function to have arguments with default values.
   iv) Omitting the return type in method definition results into exception.

g) Correct way to overload + operator.
   i) Public sample operator + (sample a, sample b)
   ii) Public abstract operator + (sample a, sample b)
   iii) Public static sample operator + (sample a, sample b)
   iv) All of the above.

h) Choose the keyword which declares an indexer
   i) Base ii) This
   iii) Super iv) Extract

i) Which of these methods used to read strings from the console?
   i) get( ) ii) getline( )
   iii) read( ) iv) readline( )

j) Choose the base class for string( ) method.
   i) System array ii) System.clues
   iii) System string iv) None of the above

2 × 10
**PART-A**

Q.2  
(a) Describe the various applications of visual studio .NET. How these applications are useful in application development?  
(b) List some of the important services the framework base classes has offered to the users.  

Q.3  
(a) Explain different types of data types available in C# with the help of suitable example.  
(b) Differentiate between the variables and constants in C# with the suitable example.  

Q.4  
(a) Describe the important characteristics of inheritance. How it is implemented in C#?  
(b) List the differences between overloading and overriding. Explain your answer with the help of suitable example.  

**PART-B**

Q.5  
(a) Differentiate between the following:  
   i) Check box and radio button.  
   ii) List box and combo box.  
   iii) Label and textbox.  
(b) Explain the term GUI. How GUI is useful in developing the windows forms?  

Q.6  
(a) Control programming plays an important role in GUI programming. Explain your answers with the suitable example by implementing at least 5 controls.  
(b) Compare the following:  
   i) Treeview and Listview  
   ii) Picture box and Image box  
   iii) MsgBox and Inputbox  

Q.7  
(a) Describe the detailed architecture of ADO.NET. How ADO.NET is helpful in establishing the database connection in windows form?  
(b) Elaborate the different data design tools. Explain at least three tools with the help of suitable example.
Q.1 Choose the correct option:

a) Michelle is in the process of adding tweens to her animation. Tweens are a characteristic of what type of animation?
   i) Vector animation  ii) AVI  iii) Raster Animation  iv) Alpha

b) Scripting languages operate by processing small blocks of code when certain events occur. Such a block of code is called:
   i) A function  ii) a handler  iii) a process  iv) a script
   v) a protocol

c) At Microsoft corporation, the product manager:
   i) Coordinates the project's internal resources.
   ii) Represents the product to the outside world.
   iii) Oversees the entire team.
   iv) Ensures the project does not go over budget.

d) The people who weave multimedia into meaningful tapestries are called ________.
   i) Programmers  ii) multimedia developers
   iii) software engineers  iv) hardware engineers

e) Multimedia elements are typically sewn together into a project using ________.
   i) authoring tools  ii) multimedia tools
   iii) audio tools  iv) video tools

f) Interleaving the audio and video segments of a video clip together in a data file is:
   i) Flare  ii) Flattening  iii) Hot Spot  iv) Helical Scan.
   v) Father.

g) Images included in many software titles are called ________.
   i) Clipart  ii) Popups  iii) .jpg files  iv) .tiff files

h) A smaller version of an image is called a:
   i) Clipart  ii) Bitmap  iii) Portable network graphic
   iv) Thumbnail

i) Designed to create a particular look, a ________ contains color schemes, slide and title masters with custom formatting and fonts styles.
   i) Template  ii) Presentation  iii) Slide  iv) Background

j) Jason is defining the target audience for an animation project. This is a component of which phase in the process of producing animation?
   i) Pre-production.  ii) Animated gif
   iii) Post production  iv) Production

2x10

PART-A

Q.2  

a) Multimedia is shifting from being localized (contained on a CD-ROM) to being distributed (available on the World Wide Web). What are some of the applications of this? Who all can access multimedia? How will you keep it secure?  

b) Medicine industry has changed with introduction of multimedia. Elaborate.

Q.3  

a) Describe the characteristics of a block of text and a typeface.
b) Discuss the problems encountered using text across computer platforms and in different languages.

Q.4 a) Discuss the difference between bitmap and vector graphics. Describe five different graphic elements you might use in a project, for example, the background, buttons, icons, or text. Would you use a vector tool or a bitmap tool for each element? Why?

b) Differentiate between MIDI and Digital Audio formats.

**PART-B**

Q.5 a) Discuss the physical and psychological principles as to why animation works? What are the different principles of Animation?

b) Briefly discuss the origins of cel animation and the concepts that go into creating these animations. Be sure to include keyframes, tweening and inks.

Q.6 a) List the steps involved in capturing video, compressing the video, and preparing it for DVD. Briefly discuss the decisions you need to make with each step regarding compromises on image quality and other limiting factors.

b) What defines the quality of video signal? What factors affect this quality? How do the various analog television formats differ in quality?

Q.7 a) Describe the four primary stages in multimedia project. Discuss the hardware most often used in making multimedia and choose an appropriate platform for a project.

b) Identify the typical members of a multimedia project team and describe the skills that they need for their work.
Q.1 Multiple choice questions:

a) Choose the characteristic of an operational system:
   i) Current data
   ii) Historical data
   iii) Contains read intensive data
   iv) Facilitates analysis of large volumes of data.

b) An operational system is:
   i) Application oriented.
   ii) Information oriented.
   iii) Analysis oriented.

c) Which is the key that is defined as a column or group of columns in one table whose values are defined by the primary key in another table?
   i) Primary key
   ii) Secondary key
   iii) Foreign key
   iv) None of these.

d) Which type of relationship does a snowflake schema contain between a fact table and every dimension table?
   i) One-to-one
   ii) One-to-many
   iii) Many-to-one
   iv) Many-to-many

e) Where do ETL functions take place?
   i) Source systems
   ii) Data warehouse
   iii) Data staging area
   iv) None of these

f) Which OLAP is best for bounded problems?
   i) ROLAP
   ii) MOLAP
   iii) DOLAP
   iv) HOLAP

g) Virtual data warehouse is suitable when:
   i) The user wants to invest less.
   ii) Risk to data has to be minimized
   iii) Time to execute a query is less.
   iv) All of the above.

h) Which system is designed to update the data in real time?
   i) Data warehouse
   ii) Operational system
   iii) Informational system

i) Data cleansing is performed in
   i) Source systems
   ii) Data warehouse repository
   iii) Data staging area

j) Which process helps the users to go in further details?
   i) Drill-down
   ii) Roll-up
   iii) Slice
   iv) Dice
Q.2  a) Explain the features of data warehouse.  
    b) What do you understand by the term data granularity? Give some advantages and disadvantages of keeping detailed data in the data warehouse.

Q.3  a) Write a short note on snowflake schema. Explain it with relevant example. Mention some of the advantages and disadvantages.  
    b) What are aggregate fact tables? Why are they needed? Justify your answer with the help of an example.

Q.4  a) What is data cube? Explain OLAP operations on a data cube.  
    b) Write a short note describing advantages, disadvantages and reasons for creating data mart.

**PART-B**

Q.5  a) Explain the difference between distributed data warehouse and virtual data warehouse with the help of suitable examples.  
    b) Give two applications of OLAP in the real world.

Q.6  a) Explain the architecture of a data warehouse.  
    b) Discuss some of the distinguishing characteristics and goals of data warehouse architecture.

Q.7  Suggest atleast five tips of building a successful data warehouse. Mention a few pitfalls which if not taken care of can result in failure of the whole project.
Q.1 Answer the following questions:
   a) What do you mean by vulnerability in information system?
   b) What do you mean by attack to information system?
   c) What is cryptology?
   d) What is a decryption algorithm?
   e) What is transposition method of encryption?
   f) What is e-cash?
   g) What was the biggest security breach of 2017 and why?
   h) List four major mistakes committed by information system users.
   i) What do you mean by crypto-currency?
   j) What are active information security attacks?

   **2 x 10**

**PART-A**

Q.2 a) Explain the SDLC of security model. Explain the role of each phase in enhancing the security.  
   b) Write five latest security trends of 2017 in details. Also write how these issues can be resolved.

   **10**

   **10**

Q.3 a) What do you mean by information security policy of an information system?  
   b) Explain the bull’s eye model for information system security.

   **10**

   **10**

Q.4 a) What are the different categories of computer criminals? Explain them.
   b) "In India, government is focusing a lot on digitization of all services including online filing of Income Tax Returns and e-filing of GST Returns." Suggest 5 ways by which organizations can restrict unauthorized access of their information system resources.

   **5**

   **15**

**PART-B**

Q.5 a) Explain the transposition method of encryption by citing an example.
   b) What is block cipher design? Explain with an example.

   **10**

   **10**

Q.6 a) What is digital signature? Explain the working of digital signature.
   b) Explain the following:
      i) Worms
      ii) Bots.

   **10**

Q.7 a) What are the steps taken by e-commerce companies to make the user’s transaction secure?
   b) Explain AES algorithm with an example.
End Semester Examination, Dec. 2018
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. Marks are indicated against each question.

Q.1 Multiple choice questions:

a) Assembly language provided an __________ way of writing programs:
   i) Structural 
   ii) Unstructured 
   iii) Both i) and ii) 
   iv) None of these.

b) In unstructured programming all the instructions of a program were written __________ in a single function.
   i) One after the other 
   ii) Two after the other 
   iii) Three after the other 
   iv) None of these.

c) It became difficult to __________ errors for large and complex programs.
   i) Trace and store 
   ii) Trace and edit 
   iii) Trace and debug 
   iv) Edit and debug

d) High Level Language such as C and Pascal were developed in the late.
   i) 1965 
   ii) 1968 
   iii) 1960 
   iv) 1962

e) High Level Language provided a __________ way of writing programs.
   i) Structural 
   ii) Structured 
   iii) Unstructured 
   iv) None of these.

f) Structured programming also known as:
   i) Procedural programming 
   ii) Object oriented programming 
   iii) Progressive programming 
   iv) None of these.

g) Structured programming was a __________ approach of writing complex programs.
   i) Stored and easy 
   ii) Powerful and easy 
   iii) Powerful and stored 
   iv) None of these.

h) In procedural programming, programs are divided in to different procedures also known as:
   i) Functions, routines or subroutines. 
   ii) Usefulness, routines or subroutines. 
   iii) Functions, structured or unstructured. 
   iv) None of these.

i) High Level Language follows the __________ approach for designing the program.
   i) Top 
   ii) Down 
   iii) Top-down 
   iv) None of these.

j) Programs in procedural programming consist of a controlling procedure __________ which controls the execution of other procedures?
   i) Known as the main 
   ii) Known as the user-friendly 
   iii) Known as the subroutine 
   iv) None of these.

UNIT-I

Q.2 a) List out various computer generations along with their basic characteristics.
b) Distinguish between analog and digital computers. 8

Q.3 a) Draw a flowchart to multiply two matrices. And also write algorithm for the same. 9
b) Explain any three input devices with detail description. 6

UNIT-II

Q.4 a) Compiler interpreter Assembler plays an important role in the execution of the program. Justify it and also differentiate it with suitable example. 10
b) How driver software helps in working of computer system? 5

Q.5 Differentiate between:
a) Application and system software.
b) Primary and secondary memory.
c) Magnetic tape and magnetic disc. 5×3

UNIT-III

Q.6 What are various type of error that can occur during programming? How debugging is a powerful feature to improve the quality of program? Explain various techniques of debugging in detail. 15

Q.7 Explain any five problem solving techniques in detail. 15

UNIT-IV

Q.8 Explain the following with their syntax and semantics:
a) Conditional statement.
b) Iterative statement.
c) Jumping statements. 5×3

Q.9 Designing and implementation of program needs various strategies. Discuss all these approaches to design a quality program. 15
End Semester Examination, Dec. 2018
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.** Marks are indicated against each question.

Q.1 Fill in the blanks:
   a) In function overloading, two functions can have the same ________ in the program.
   b) Dynamic allocation of memory is done by ________ operator.
   c) When a function calls itself, it is called as ________.
   d) A pointer that points to nothing is called ________.
   e) ________ loop executes at-least once.
   f) A ________ is a group of data elements that may have different data types.
   g) Each string is terminated with a ________.
   h) Enumeration is a ________ type.
   i) ________ is an instance of a class.
   j) The symbol for scope resolution operator is ________.

   **1½×10**

**UNIT-I**

Q.2 a) What is the use of header files in C? Name two most widely uses header files. 5
   b) What are identifiers in C? 5
   c) What is difference between compilation and execution? 5

Q.3 a) Write a program in ‘C’ that display “Manav Rachna is the best”. 7
   b) Write a program to print table of 50. 8

**UNIT-II**

Q.4 a) What is the difference between unary and binary operator? 5
   b) Explain typecasting with example. 5
   c) What is condition operator? Give example to justify. 5

Q.5 a) Write a program that input two numbers \( a, b \) and print their sum, difference, product and quotient. 10
   b) Define operator and operand with example. 5

**UNIT-III**

Q.6 a) Write a program that prints

   A
   B B
   C C C
   D D D D
   E E E E E

   b) Differentiate between getchar( ) and gets( ). 5

Q.7 Write a ‘C’ program for the structure given below:

<table>
<thead>
<tr>
<th>Title</th>
<th>Author Name</th>
<th>Cost</th>
<th>Publisher</th>
</tr>
</thead>
</table>

**UNIT-IV**
Q.8 Explain the following storage classes:
   a) Explain automatic storage class with example.  
   b) Explain static storage class with example.

Q.9 a) Write the purpose of following functions of file handling.
   i) fclose  ii) feof  
   iii) getc  iv) fgetchar  
   v) fopen  vi) fprintf  
   vii) fputc  viii) fputs  
   ix) fread  x) fscan

b) What is EOF? Explain its utility.
End Semester Examination, Dec 2018  
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 Answer the following:

a) Find the values of $x$ and $y$ if 
$$
\begin{bmatrix}
 2 & 5 \\
 7 & y-3
\end{bmatrix} + \begin{bmatrix}
 3 & -4 \\
 1 & 2
\end{bmatrix} = \begin{bmatrix}
 7 & 6 \\
 15 & 4
\end{bmatrix}.
$$

b) Evaluate $\frac{12!-10!}{9!}$.

c) There are 6 candidates for 3 posts. In how many ways can the posts be filled?

d) If $\tan A = \frac{43}{1}$, the find the value of $\cos A$.

e) The number of terms in the A.P. 2, 5, 8, ..., 59 is _______.

f) Evaluate $7!+5!$.

g) If $4P_n = 5^4 P_3$, the find $n$.

h) If 5\textsuperscript{th} term of a G.P. is 2, then find the product of first 9 term.

i) Find ‘a’ if the 17\textsuperscript{th} and 18\textsuperscript{th} terms in the expansion of $(2+a)^5$ are equal.

j) If $A = \begin{bmatrix} 2 & 3 \\ 4 & 7 \end{bmatrix}$ find $f(A)$ where $f(x) = x^2 - 5x - 2$.

Q.2 a) Find the value of $x$ such that 
$$
\begin{bmatrix}
 1 & 3 & 2 \\
 2 & 5 & 1 \\
 15 & 3 & 2
\end{bmatrix}
\begin{bmatrix}
 1 \\
 2 \\
 x
\end{bmatrix} = 0
$$

b) Prove that 
$$
\begin{vmatrix}
 x+y & x & x \\
 5x+4y & 4x & 2x \\
 10x+8y & 8x & 3x
\end{vmatrix} = x^3
$$

Q.3 a) Solve the following system of equation by Cramer’s rule:

- $6x + y - 3z = 5$
- $x + 3y - 2z = 5$
- $2x + y + 4z = 8$

b) Find the adjoint of $A$, where:
$$
A = \begin{bmatrix}
 1 & 2 & 3 \\
 0 & 5 & 0 \\
 2 & 4 & 3
\end{bmatrix}
$$

**UNIT-II**
Q.4  a) Find the middle term in the expansion of \((x^2 - \frac{2}{x})^{10}\).

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

Q.5  a) How many three digit odd numbers can be formed from the digits 1, 2, 3, 4, 5, 6 when
i) Repetition of digits is not allowed.
ii) Repetition of digits is allowed.

b) Simplify \(\frac{3^3 \times 27^3 \times 9^4}{3 \times (81)^4}\).

Q.6  a) Prove that: \(\sin^4 \theta + \cos^4 \theta = 1 - 2\sin^2 \theta \cos^2 \theta\).

b) Prove that: \(\frac{\sin(A - B)}{\cos A \cos B} + \frac{\sin(B - C)}{\cos B \cos C} + \frac{\sin(C - A)}{\cos C (\cos A)} = 0\).

Q.7  a) Find the value of: \(\frac{2 \log 6 + 6 \log 2}{4 \log 2 + \log 27 - \log 9} = \frac{3}{2}\).

b) Show that: \(\frac{\log \sqrt{27} + \log \sqrt{8} - \log \sqrt{125}}{\log 6 - \log 5} = \frac{3}{2}\).

Q.8 If: \(f(x) = x^2 + 2x^2 - 5x + 11\), find the value of \(f\left(\frac{9}{10}\right)\) with the help of Taylor’s series.

Q.9  a) If \(f(x) = \begin{cases} \frac{x^2 - 1}{x - 1}, & \text{when } x \neq 1 \\ 2, & \text{when } x = 1 \end{cases}\),

Show that \(f(x)\) is continuous at \(x = 1\).

b) Differentiate w.r.t \(x\):

\(Y = (x^2 + 1)2\sqrt{2x - 5}\)
Q.1  
**Multiple choice questions:**

a) ________ is the collection of records of the entities in a given entity set.
   i) Field 
   ii) Record 
   iii) Entity 
   iv) File

b) ________ is called first in first out (FIFO)
   i) Tree 
   ii) Stack 
   iii) Queue 
   iv) Graph

c) ________ loop uses a condition to control the loop.
   i) Repeat for 
   ii) Repeat 
   iii) Continue 
   iv) Repeat-while

d) ________ function of C is used to allocate a block of memory.
   i) Malloc 
   ii) Calloc( ) 
   iii) Free 
   iv) Realloc( )

e) String with zero characters is called ________ string.
   i) NULL 
   ii) Binary 
   iii) Totalled 
   iv) List

f) ________ list is a specialized list that is maintained, which consists of unused memory cells.
   i) Linear 
   ii) Doubly linked 
   iii) Circularly linked 
   iv) Free storage

g) A tree is said to be ________ if all its levels accept possibly the last, have the maximum number of possible nodes, and if all the nodes at the last level appears as far left as possible.
   i) Balanced 
   ii) Complete 
   iii) Threaded 
   iv) Expression

h) A terminal node in a binary tree T is called ________.
   i) Edge 
   ii) Path 
   iii) Leaf 
   iv) Branch

i) In tree construction which is the most suitable data structure?
   i) Array 
   ii) Stack 
   iii) Linked list 
   iv) Queue

j) A graph is said to be ________ if there is a path between any two of its nodes:
   i) Connected 
   ii) Complete 
   iii) Balanced 
   iv) Binary

UNIT-I

Q.2  

a) What do you mean by primitives and non-primitives data types? Explain in detail. 10

b) What do you mean by recursion? 5

Q.3  

a) Write a program in ‘C’ language to implement sparse matrix. 10
b) How to measure performance of an algorithm? 5

UNIT-II

Q.4  a) Write a program using ‘C’ language to convert an infix expression to prefix form. 10
    b) Differentiate between linear data structure and non-linear data structure. 5

Q.5  Write a program to perform following operations on a linked list.
    a) Traversing.
    b) Searching.
    c) Sorting. 5×3

UNIT-III

Q.6  a) What is B+ tree? Why is it used? 5
    b) Suppose you have to delete a node from a binary search tree. Write an algorithm to perform this. 10

Q.7  a) Write a program using the DFS method for graph traversal. 10
    b) What is minimum spanning tree? 5

UNIT-IV

Q.8  a) Write a program in ‘C’ to implement merge sort. 10
    b) What is the use of hashing functions? 5

Q.9  a) What is max heap and min heap? 5
    b) Write a program in ‘C’ to implement bubble sort. 10
End Semester Examination, Dec. 2018  
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**. Marks are indicated against each question.

**Q.1**  
a) Properties of an object are stored as rows in a table. **(TRUE/FALSE)**  
b) A primary goal of a database system is to share data with multiple users. **(TRUE/FALSE)**  
c) If there is a relationship between two tables, this indicates that ________.  
d) How does an outer join differ from inner join?  
e) A sub-table is just a portion of a larger table. **(TRUE/FALSE)**  
f) Which component of a DBMS is responsible for storing, retrieving and updating data?  
i) Database Engine.  
ii) Query Engine.  
g) After conceptually designing your database the information contained in a single class would normally be stored in a ________.  
h) Referential integrity constraints are used to ________.  
i) The command that indicates that a transaction has successfully completed and that changes must now be made permanent is ________.  
j) A primary key can point to more than one object. **(TRUE/FALSE)** 

1½×10

**UNIT-I**

**Q.2** Write short notes on the following:  
a) Data independence.  
b) Applications of DBMS.  
c) Cardinality ratio.  

5×3

**Q.3** What are data models? Explain their different types.  

15

**UNIT-II**

**Q.4**  
a) What is SQL? Explain its important features.  
b) Determine the output when the following operations are applied on relations $R_1$, $R_2$, and $R_3$ given below:

<table>
<thead>
<tr>
<th>$R_1$</th>
<th>$R_2$</th>
<th>$R_3$</th>
</tr>
</thead>
<tbody>
<tr>
<td>$X$</td>
<td>$A$</td>
<td>$A$</td>
</tr>
<tr>
<td>$Y$</td>
<td>$B$</td>
<td>$B$</td>
</tr>
<tr>
<td>$A_1$</td>
<td>$A_2$</td>
<td>$A_3$</td>
</tr>
<tr>
<td>$B_1$</td>
<td>$B_2$</td>
<td>$B_3$</td>
</tr>
<tr>
<td>$A_2$</td>
<td>$A_6$</td>
<td>$A_3$</td>
</tr>
<tr>
<td>$B_2$</td>
<td>$B_6$</td>
<td>$B_3$</td>
</tr>
<tr>
<td>$A_3$</td>
<td>$A_7$</td>
<td></td>
</tr>
<tr>
<td>$B_3$</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

i) Union ($R_1 \cup R_3$)  
ii) Intersection ($R_1 \cap R_2$)  
iii) Cartesian cross section ($R_1 \times R_2$)  
iv) Difference ($R_2 - R_1$)
Q.5 a) What is DDL? How it is different from DML? Briefly explain guidelines for creation of a table.

b) What are integrity constraints? Explain two types of integrity constraints with the help of an example.

UNIT-III

Q.6 a) Differentiate between BCNF and 3NF. Why BCNF is considered as a stronger form of 3NF.

b) What are the problems caused by deadlock? Give a mechanism to detect deadlock.

Q.7 a) Discuss the multiversion techniques for concurrency control.

b) Consider the relation R (A, B, C, D, E, F, G, H) with functional dependency set as

\[ \{ A \rightarrow C; B \rightarrow CG; AD \rightarrow EH; C \rightarrow DF; A \rightarrow H \} \]

i) Determine key for relation R

ii) Decompose R into 2NF, 3NF and in BCNF.

UNIT-IV

Q.8 What do you mean by database security and database integrity? Are the two terms interrelated, if so then draw the suitable diagram in support of your answer.

Q.9 Why a transaction failed? What are the reasons for failure? How a failure transaction can be recovered? Explain.
End Semester Examination, Dec. 2018
BCA – First Semester
LOGICAL ORGANIZATION OF COMPUTERS (BCA-2003)

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

Note: Attempt **FIVE** questions in all. Q.1 is compulsory. Attempt any **ONE** question from each **UNIT**. Marks are indicated against each question.

Q.1 Answer the following:
   a) What is full adder?
   b) In Boolean algebra A+A is equal to _______________.
   c) Subtract 1111 and 1000
   d) Hexadecimal equivalent of 110111110001 is ______________.
   e) Which number system has a base of 16?
      i) Decimal  ii) Octal  iii) Hexadecimal  iv) None of these.
   f) A binary number system has how many digits?
      i) 0  ii) 1  iii) 2  IV) 10
   g) Is complement of 11001010 is ______________.
   h) Boolean expression for a two-input AND gate_____________.
   i) Draw the logic diagram of X-or gate.
   j) Flip-flop is a _________ circuit.
      i) Combinational  ii) Sequential  iii) Both (i) and (ii)  iv) None of these.

UNIT-I

Q.2 Solve the following:
   a) \((0.6875)_{10} = (?)_2 = (?)_8\) 5
   b) Find the 2's complement of 9.8 4
   c) Subtract 1110 and 1011 using 2's complement. 3
   d) Draw the circuit diagram of J-K flip-flop. 3

Q.3 Write short notes on:
   a) Basic gate Vs Universal gates. 7½x2
   b) Multiplexer and Demultiplexer

UNIT-II

Q.4 Simplify the following using k-map:
   a) \(f= \Sigma m(5,6,7,8,9,10,11,14,15)\) 7½x2
   b) \(f= \Sigma m(0,1,2,4,5)\) 7½x2

Q.5 Write short note on:
   a) With the help of suitable circuit diagram and truth table, explain the working of full-subtractor. 8
   b) Simplify the expression:
      \(ABD + ABC\bar{D} + A + \bar{D}(\bar{A}\bar{B}\bar{C})\) 7
UNIT-III
Q.6 Write short notes on:
   a) Error detecting and correcting codes.                      7½x2
   b) Binary codes.                                              7½x2
Q.7 Discuss different types of flip-flops with suitable circuit diagram and truth.  15

UNIT-IV
Q.8 Write short notes on:
   a) Volatile and non-volatile memory.                7½x2
   b) Microprocessor basic components and parallel processing.  7½x2
Q.9 a) Explain the difference between virtual memory, cache memory and associative memory.  8
       b) Differentiate between RAM, ROM and EPROM.  7
INFORMATION TECHNOLOGY TRENDS (BCA-3002)

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

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

Q.1   a) What is spoofing?
      b) Write two applications of mobile.
      c) Give the concept of lettering.
      d) What is SIM?
      e) What is the role of IT in Banking?
      f) Define Web Jacking?
      g) Technology that helps companies to change business by allowing them to use new methods is ________.
      h) What operating system is used as the base of the android?
      i) Define Artificial Intelligence.
      j) What is software as a service?

Q.2   Compare between the following:
      a) 3G and 4G generation.
      b) Smart phones and tablets.
      c) IOS and android platform.

Q.3   a) How a smart phone is better than traditional phone? Justify your answer.
      b) Define ‘communication technology’. What is the most commonly used mobile platform in communication? Explain its features.

Q.4   How can one say that the cloud computing visualizes the different cloud models with respect to services? How does it take into account that different types of services can be offered as cloud services? Explain.

Q.5   a) Explain the business benefits of cloud computing.
      b) Describe the service models of cloud computing.

Q.6   Write short notes on:
      a) E-mail spoofing.
      b) Password sniffing.
      c) Hacking.

Q.7   What is computer networks intrusion? How can we protect ourself from network intrusion?

Q.8   a) How E-Commerce has changed the today’s life? Explain.
      b) Compare: E-Commerce and M-Commerce.
Q.9 What is data mining? Explain the role of it in banking and marketing.
End Semester Examination, Dec. 2018  
BCA (Bachelor of Computer Application) – Third Semester  
NUMERICAL ANALYSIS AND STATISTICAL TECHNIQUES (BCA-3003)

Time: 3 hrs.  Max Marks: 75  
No. of pages: 2  
Note: Attempt FIVE questions in all; taking at least ONE question from each UNIT.  
Q.1 is compulsory. All questions carry equal marks.

Q.1  
a) Define:  
i) Trancedental equation.  
ii) Absolute error.  
iii) Interpolation.  
iv) Bisection method.  
v) Rule 1 of absolute error because of translation.  
vi) Sampling.  

b) Order of convergence of Regula Falsi method is __________.  

1½x6  
c) We wish to solve \( x^3 - 2 = 0 \) by Newton raphson technique. If initial guess is \( x_0 = 1.0 \) then estimate value of \( x_1 \) will be __________.  

1½x2  
d) Round off the number 75462 to four significant digits and then calculate the absolute error and relative error.  

3

UNIT-I

Q.2  
a) Find a root of equation \( x^3 - 4x - 9 = 0 \). Using bisection method upto 3 decimal places.  

8  
b) Given \( \frac{dy}{dx} = \frac{y-x}{y+x} \) with \( y = 1 \) for \( x = 0 \). Find \( y \) approximately for \( x = 0.1 \) by euler’s method.  

7

Q.3  
Evaluate \( \int_{0}^{4} \frac{dx}{1+x^2} \), by using  
i) Simpson’s \( \frac{1}{3} \)rd Rule.  

ii) Simpson’s \( \frac{3}{8} \)th Rule.  

iii) Trapezoidal Rule.  

15

UNIT-II

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

\[ x: \quad 0 \quad 1 \quad 2 \quad 3 \]
\[ f(x): \quad 1 \quad 2 \quad 1 \quad 10 \]

7  
b) Estimate the missing term in the following:  

\[ x: \quad 1 \quad 2 \quad 3 \quad 4 \quad 5 \quad 6 \quad 7 \]
\[ y: \quad 2 \quad 4 \quad 8 \quad - \quad 32 \quad 64 \quad 128 \]

8

Q.5  
By the method of least square, find the straight line that best fit the following data:  

\[ x: \quad 1 \quad 2 \quad 3 \quad 4 \quad 5 \]
\[ y: \quad 14 \quad 27 \quad 40 \quad 55 \quad 68 \]

15
UNIT-III

Q.6  a) Calculate mean median and mode for the distribution of the weights of 150 students from the data given below:

<table>
<thead>
<tr>
<th>Weight (in kg)</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>30–40</td>
<td>18</td>
</tr>
<tr>
<td>40–50</td>
<td>37</td>
</tr>
<tr>
<td>50–60</td>
<td>45</td>
</tr>
<tr>
<td>60–70</td>
<td>27</td>
</tr>
<tr>
<td>70–80</td>
<td>15</td>
</tr>
<tr>
<td>80–90</td>
<td>8</td>
</tr>
</tbody>
</table>

Q.7  Find correlation coefficient between the sales and expenses from the data given below:

<table>
<thead>
<tr>
<th>Firm</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
<td>50</td>
<td>50</td>
<td>55</td>
<td>60</td>
<td>65</td>
<td>65</td>
<td>65</td>
<td>60</td>
<td>60</td>
<td>50</td>
</tr>
<tr>
<td>Expenses</td>
<td>11</td>
<td>13</td>
<td>14</td>
<td>16</td>
<td>16</td>
<td>15</td>
<td>15</td>
<td>14</td>
<td>13</td>
<td>13</td>
</tr>
</tbody>
</table>

UNIT-IV

Q.8  What is the importance of sampling techniques? Describe the various sampling techniques.

Q.9  Differentiate the following:

a) Statistic and parameter.

b) Null and alternative hypothesis.

c) Type-I and Type-II error.
Summer Semester Examination, Dec., 2018  
B.C.A. – Forth Semester  
WEB APPLICATION DEVELOPMENT (BCA-4001)

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

Note: Attempt **FIVE** questions in all. **Q.No. 1 is compulsory.** Attempt Any **ONE** question from each Unit. Each question carries equal marks.

Q.1 a) Each computer connected to internet must:
    i) be an IBM PC (2) have unique IP address 
    ii) be internet compatible 
    iii) have a modem connection.

b) The preferred topology for LAN is ________: 
   i) Star 
   ii) Bus 
   iii) Ring 
   iv) Mesh.

c) A table is two dimensional matrix consists of __________ and __________

d) Javascript is scripting language created by __________.

e) Extension of Javascript file is ________________

f) The preferred topology for LAN is ________________

g) HTML stands for ________________

h) CSS stands for ________________

i) A tag used in HTML to link it with other URL’s is ________________

j) Which tag is used for arranging tags in paragraphs ________________  

**UNIT-I**

Q.2 Write a short note on:
   a) Search engine 
   b) Internet addressing 
   c) E-mail

**UNIT-II**

Q.3 What is network? Differentiate client/server, peer-to-peer and server based networks

Q.4 write short note on:
   a) What do you mean by HTML? Explain the structure of HTML.
   b) Explain various formatting tags of HTML.
   c) How can one create an image in HTML.
Q.5  a) Write the source code for the frame divided into three rows (20%, 50%, remaining)
Divide first row into three equal columns. Every frame should have source file. 10

b) Differentiate ordered and unordered list using suitable example. 5

UNIT-III

Q.6  Design an admission form in HTML using suitable objects and controls. 15

Q.7  Design a student database table in HTML using all attributes of table. 15

UNIT-IV

Q.8  Answer the following:
  a) What are the different data types in Javascript? 5
  b) Write a program in Javascript to swap two images. 10

Q.9  What are cascading stylesheets? Differentiate external, internal and inline stylesheets using suitable examples. 15
Q.1 Answer the following questions:

a) Which of the following sets are equal?
   \[ \{p, q, r\}, \{r, p, q\}, \{p, q, r, q\} \] .

b) Find the matrix of the relation:
   \[ R = \{(P,1), (P,2), (q,1), (r,2), (s,1)\} \] defined on the set \( A = \{p, q, r, s\} \) and \( B = \{1, 2, 3\} \).

c) Use truth table to verify the following equivalence:
   \[ \neg (Q \cup (P \cap Q)) \cup P \] .

d) Give the negation of the following statement and write in the propositions:
   “If I do not win the game, then I will not enter the contest”.

e) Define “Poset”.

f) Write the dual of following statement:
   \[ (a \cup b) \cup c = (b \cup c) \cup (c \cup a) \] .

g) State the “Idempotent laws”.

h) Prove the number of vertices of odd degree in a graph \( G \) is always even.

i) Draw two graphs which are isomorphic.

j) Give an example of the graph which is Hamiltonian but not evlerian.

 UNIT-I

Q.2 A survey of a sample of 50 new cars being sold at a local auto dealer was conducted to see which of the three popular options air conditioning, radio and power windows were already installed in the ear. The survey found the following details:

a) 40 had air conditioning.

b) 37 had radio.

c) 36 had power windows.

d) 30 had air conditioning and power windows.

e) 34 had air conditioning and radio.

f) 29 had radio and power windows.

g) 28 had all the three options.

Find the number of ears that had:

i) Only power windows.

ii) Only air conditioning.

iii) Only radio.

iv) Radio and power windows but not air conditioning.

v) Air conditioning and radio, but not power windows.

vi) Only one of the options.

vii) None of these options.

1½×10

Q.3 a) Describe Hasse diagram of the following diagraph:
b) Let $M_R = \begin{pmatrix} 0 & 1 & 1 \\ 1 & 0 & 1 \\ 1 & 1 & 0 \end{pmatrix}$ be the matrix of the relation R. Find $R^2$ and $R^{-1}$.

**UNIT-II**

Q.4 Solve the following recurrence relations:

a) $a_n - 2a_{n-1} + a_{n-2} = 2$, $a_0 = 25$ and $a_1 = 16$.

b) $a_n + 6a_{n-1} + 9a_{n-2} = 3$, $a_0 = 0$ and $a_1 = 1$.

Q.5 a) Prove or disprove that $P - (Q - R) = (P - Q) - R$.

b) Show that $(P \cup Q) \cap (P \cap Q)$ is a tautology.

c) State and prove De-Morgan law using truth table.

**UNIT-III**

Q.6 a) Prove that $D_n$ is not a Boolean algebra when $n = 40, 75$.

b) Prove the following Boolean identities:
   
   i) $(xy + x'y') = x$.
   
   ii) $(xyz + xy) = xy$.

Q.7 Consider the lattice $D_{12} = \{1, 2, 3, 4, 6, 12\}$ the divisors of 12 ordered by divisibility. Find:

a) The lower and upper bound of $D_{12}$.

b) The complements of 4 and 6.

c) Is $D_{12}$ a complemented lattice?

**UNIT-IV**

Q.8 Discuss the pre-order, in-order and post-order traversal of trees using a suitable example.

Q.9 Consider the graph shown below and find:

- All cycles (If any).
- All cut points.
- Degree of each vertex.
- All paths from a to g.
- Diam (G), the diameter of G.
Q.1  **Multiple choice questions:**
a) Protection of data from a natural disaster such as a tornado is a network ________ issue:
   i) Performance
   ii) Reliability
   iii) Security
   iv) Management.

b) In a network with 25 computers, which topology would require the most extensive cabling?
   i) Mesh
   ii) Star
   iii) Bus
   iv) Ring.

c) In a ________ connection, more than two devices can share a single link:
   i) Point to point
   ii) Multipoint
   iii) Primary
   iv) Secondary

d) The ________ layer can used trailer of the frame for error detection:
   i) Physical
   ii) Data link
   iii) Transport
   iv) Presentation

e) Which of the following can be determined from a frequency domain graph of a signal:
   i) Bandwidth
   ii) Phase
   iii) Power
   iv) All of the above.

**Fill in the blanks:**

f) When one of the components of a signal has a frequency of zero, the average amplitude of the signal is ________.

g) If the bit rate for an FSK signal is 1200 pps, the baud rate is ________.

h) Modulation of an analog signal can be accomplished through modulation of the ________ carrier signal.

i) Switched service means that connection between subscribers must involve ________.

j) The retransmission of damaged or lost frames in the data link layer is known as ________.

**UNIT-I**

Q.2  a) How do the layers of TCP/IP protocol suit correlate to the layers of OSI model? Discuss.
b) Discuss the merits and demerits of star and bus topologies

Q.3 Explain the following:
a) Service point addressing.
b) Modes of transmission.
c) Phase modulation.

UNIT-II

Q.4 a) Discuss the three major classes of guided media with example.
b) How does FDM combine multiple signals into one signal? Explain.

Q.5 In stop and wait flow control, define and discuss the handling of ‘A damaged frame’ and ‘A lost frame’ with example.

UNIT-III

Q.6 Explain IEEE 802.4 standard with its architecture and its working in detail.

Q.7 What are the various routing protocols used in computer networks? Explain shortest path routing and hierarchical routing?

UNIT-IV

Q.8 What is meant by public key encryption and private key encryption? Discuss the various conventional methods of these two.

Q.9 Write short notes on:
a) UDP
b) SMTP
c) Telnet
End Semester Examination, Dec. 2018
BCA (Bachelor of Computer Application) – Fifth Semester
JAVA PROGRAMMING (BCA-5002)

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

Note: Attempt **FIVE questions in all; Q.1 is compulsory.** Attempt any **TWO questions from Part-A and TWO questions from Part-B.** Marks are indicated against each question.

Q.1 Give short answers to the following:
   a) What is operator precedence?
   b) What are the different methods of creating an object?
   c) What is encapsulation?
   d) Explain the concept of function overloading.
   e) Explain final class.

   **PART-A**

Q.2 What are the different features of Java? Explain platform independence in Java.

Q.3 Give difference between Abstract class and interface. Give examples of both.

Q.4 Write short notes on the following:
   a) This keyword
   b) Finalize
   c) Static

   **PART-B**

Q.4 Explain the concept of Inheritance with examples. What are the different types of inheritance in Java?

Q.6 Write short notes on the following:
   a) super
   b) finally
   c) synchronize

Q.7 What are threads? Explain the concept of thread synchronization in detail. Give suitable example.
Q.1  a) Which of the following is not a type of assembler?
   i) One pass             ii) Two pass
   iii) Three pass         iv) Load and go

b) Translator for low level programming language were termed as:
   i) Assembler            ii) Compiler
   iii) Linker             iv) Loader

c) The macro definition consist of:
   i) Macro prototype statement.
   ii) One or more model statements.
   iii) Macro pre-processor statements.
   iv) All of the above.

d) A program execution is called:
   i) Process              ii) Instruction
   iii) Procedure          iv) Function

e) An assembly language is a:
   i) Low level programming language.
   ii) Middle level programming language.
   iii) High level programming language.
   iv) Internet based programming language.

f) Which of the following system software resides in main memory always:
   i) Text editor            ii) Assembler
   iii) Linked               iv) Loader.

g) An imperative statement is:
   i) Reserves areas of memory and associates names with them.
   ii) Indicates action to be performed during execution of assembled program.
   iii) Indicates an action to be performed during optimization.
   iv) None of these.

h) In compiler design “reducing the strength” refers to:
   i) Reducing range of values of input variable.
   ii) Code optimisation using cheaper machine instructions.
   iii) Reducing efficiency of program.
   iv) None of these.

i) Which phases of compiler generates stream of atoms:
   i) Syntax analysis      ii) Lexical analysis
   iii) Code generation    iv) Code optimisation

j) Parsing is also known as:
   i) Lexical analysis     ii) Syntax analysis
   iii) Semiantic analysis iv) Code generation.  

\[1\frac{1}{2} \times 10\]
UNIT-I

Q.2 Write short notes on:
   a) Macros.
   b) Code optimisation.
   c) Interpreters.  

Q.3 What is system programming? What are the various components of system programming?  

UNIT-II

Q.4 What are compilers? What are the different phases of compiler?  

Q.5 Write down an algorithm for macro preprocessor and also explain its functioning using an appropriate example.  

UNIT-III

Q.6 What are loaders? Explain the functionality of “compile & Go” and “absolute loader”?  

Q.7 Write short notes on:
   a) Binders.
   b) Relocalability.  

UNIT-IV

Q.8 What is assembler? Explain two pass assembler with its algorithm in detail.  

Q.9 a) Differentiate assemblers, interpreters and compilers with examples.
   b) What are the various statements of assembly language?
End Semester Examination, Dec. 2018
BCA – Second Semester
BUSINESS COMMUNICATION-I (CA-GE-02)

Time: 3 hrs. Max Marks: 50
No. of pages: 1

Note: Attempt FIVE questions in all; Q.1 is compulsory. Attempt any TWO questions from Part-A and TWO questions from Part-B. Marks are indicated against each question.

Q.1 Give ONE word for the following:
   a) Study of body language.
   b) An account of a person’s qualifications and experience.
   c) A person’s ability to do something well.
   d) Any form of non-verbal communication.
   e) A face-to-face question answer session with a single person.

Choose the correct verb from the brackets:
   f) Today the (weather, whether) is good.
   g) The policeman (catch, catching) the thief red handed.
   h) This class has all boys (except, expect) one girl.
   i) Her mother’s sister is her (aunt, aunt).
   j) When we were in America we (go, went) for long walks every day? 1×10

PART-A

Q.2 Write short notes on:
   a) Effective listening techniques. 5×2
   b) Oral communication skills.

Q.3 a) Discuss the application and importance of the 6C’s in making business communication effective. 5
   b) Give a farewell speech for the CEO of your company who is leaving the organization. 5

Q.4 As the general manager of your company, write a memo to the employees of your department about late coming and the consequences they will have to face. Explain the significance of business letters to make good business relationships. 10

PART-B

Q.5 Design a presentation on “stress management” with at least 8-10 slides. 10

Q.6 Write an application for the post of a software engineer at Microsoft. Also write your resume for the above post. 10

Q.7 Discuss the importance of human relations at the workplace. Explain 5 do’s and 5 don’ts to be kept in mind while preparing for an interview. 10
End Semester Examination, Dec. 2018  
BCA – Fourth Semester  
BUSINESS COMMUNICATION (CA-GE-04)  

Time: 2 Hours                       Max Marks: 50  
No. of pages: 1

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

Q.1 **State whether the following statements are TRUE or FALSE. Give reasons:**
   a) Stress management and empathy are communication techniques.  
   b) Communication is a one-way process.  
   c) There are 5 C’s of effective communication.  
   d) Grapevine is a type of gossip network.  
   e) Language barrier is a common barrier to effective communication.  

   2x5

**PART-A**

Q.2 Write in brief about the various communication techniques.  
10

Q.3 Briefly describe verbal and non-verbal communication.  
10

Q.4 What role does body language play in communication?  
10

**PART-B**

Q.5 Write about the 7 C’s of communication.  
10

Q.6 What are the common barriers to effective communication?  
10

Q.7 Who is a leader and what are the different leadership styles?  
10
Q.1 a) Copyright is a form of protection which is provided to the Authors of original work of Authorship.
   i) True        ii) False
b) Computer to computer exchange of business documents is done through:
   i) EDI
   ii) ERP
   iii) CAD
   iv) CAM
c) Information Technology Act in India was amended in:
   i) 2000
   ii) 2004
   iii) 2008
   iv) 2010
d) Which is the act of providing legal framework for e-governance in India?
   i) IT Amendment Act
   ii) IT Act
   iii) Indian Penal Code
   iv) None of the above
e) What is the duration of copyright protection for a Novel?
   i) A Novel will not gain copyright protection
   ii) The day author dies
   iii) For 10 years
   iv) None of the above
f) Which of the following is not the essential element for a patent to be granted?
   i) Be a product
   ii) Be new to public
   iii) Innovative
   iv) Capable of industrial applications
g) To come under IT Act, a crime must involve a computer and its network:
   i) True        ii) False
h) India is a member country of organization for economic co-operation and development:
   i) True        ii) False
i) Digital signature can be issued to individuals:
   i) True        ii) False
j) When software is pirated; it harms:
   i) Management
   ii) People
   iii) Individuals
   iv) Software developers.
**PART-A**

Q.2 Explain the following in terms of cyber crime:
   i) Need of cyber law.
   ii) Computer and web technology.
   iii) Web technology and related security threats.  

Q.3 a) What are the roles of Asia Pacific Economic Corporation (APEC) to control cyber disputes / crimes?  
     b) Explain in brief Budapest convention on cyber-crime.  

Q.4 a) What provisions in the IT-Act are there to protect against violation of privacy?  
     b) How freedom of speech and expression should be monitored by a user in cyberspace?  

**PART-B**

Q.5 a) What are the requirements of digital signature? How authentication is maintained using digital signature?  
     b) Write short notes on:
        i) Cyber terrorism.
        ii) Cyber defamation.  

Q.6 Briefly explain the concept of:
   a) Jurisdiction.  
   b) Cyber Torts.  

Q.7 Answer the following:
   a) What is copyright infringement?  
   b) What types of works can be protected by copyright law?  
   c) What are the remedies of Domain name disputes?  

Q.1 State whether the following statements are **TRUE** or **FALSE**:
   a) Keeping a conversation going is a "dying art".
   b) Emotions include feelings, expressions and actions.
   c) Stress management strategies include physical exercise.
   d) Emotions are intense feelings that are always directed at someone or something.
   e) It is okay to show nervousness during an interview.

   **PART-A**

Q.2 Discuss the basic Do's and Don'ts of interview skills.  

Q.3 Define Emotions and write about their different types.  

Q.4 Write in brief about the factors that aid voice production.  

   **PART-B**

Q.5 Write about the 7 C's of communication.  

Q.6 Discuss the various types of barriers to communication.  

Q.7 What is the meaning of Verbal and Non-verbal communication? Discuss.
End Semester Examination, Dec. 2018
B. Sc. (Information Technology) – Sixth Semester
SOCIAL MEDIA NORMS AND ETIQUETTES (CA-GE-31)

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

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

Q.1 Compare the following:
   a) Instagram and snapchat.
   b) Facebook and LinkIn.
   c) Myspace and Friendfeed. 5x3

**PART-A**

Q.2 a) Describe the term social networking. How social networking is helpful in the search of job. 8
   b) Explain the strategies for listening and talking within online communities. 7

Q.3 a) There are number of advantages and disadvantages of social media. Explain your answer with the helping suitable example. 8
   b) Elaborate the different ways how social media is liuming the social skills. 7

Q.4 a) Describe the different email etiquettes in detail. How much they are important in the professional life. 6
   b) According to a survey it has been notified that social media plays a very important role in spreading information. Do you agree with the statement mentioned? If yes then figure out few positives of social media in content to the above statement. 9

**PART-B**

Q.5 a) Describe different types of social networking crimes in detail with the help of suitable example. 8
   b) Explain the different factors involving in branding of any product on social media. Do you really think that social media plays an important role in this regard. 7

Q.6 a) Describe the different social networking laws available in India. Explain your answer with the help of suitable example. 9
   b) There are number of tools through which we can measure the social media on particular thermometers? Explain atleast five different tools in this regard. 6

Q.7 Differentiate between the following:
   a) Staking and Robbery.
   b) Cyber bullying and harassment.
   c) Scams and Deformation. 5x3
Q.1 State whether the following statements are TRUE or FALSE: Give reasons:
a) The ice berg phenomena is applicable to human beings.
b) Attitudes are generally positive or negative views of a person.
c) Self-awareness is all about knowing your strengths and weaknesses.
d) Wellness programs are said to be great stress busters.
e) Stress management strategies include physical exercise.

2×5

PART-A

Q.2 Discuss the various stress management strategies. 10

Q.3 What is self-awareness? Write in brief about how to improve self-awareness. 10

Q.4 What are the various components of Attitude? Discuss the Iceberg theory. 10

PART-B

Q.5 Write about verbal and non-verbal communication and their importance. 10

Q.6 Discuss the basic Do's and Don'ts of interview. 10

Q.7 Define Time management. What are the characteristics of good time managers? 10
Q.1 State whether the following statements are TRUE or FALSE. Give reasons.
   a) A resume should be clear and to the point.
   b) Stress management strategies include physical exercise.
   c) The tone of our voice conveys our emotions to the audience.
   d) During an interview it is okay to look down at all times.
   e) Telephone etiquette includes letting the other person hang up first.

2×5

PART-A

Q.2 Define “Time Management”. What are the characteristics of good time managers?
   10

Q.3 Write about verbal and non-verbal communication and their importance.
   10

Q.4 Discuss the basic Do's and Don'ts of interview.
   10

PART-B

Q.5 Write in brief about business etiquette.
   10

Q.6 What is communication? Write about the various barriers to communication.
   10

Q.7 Write in brief about positive and negative body language.
   10
Q.1 State whether the following statements are **TRUE or FALSE:**

a) Good body language includes positive eye contact and good posture.
b) Inter personal skills are important in building good relationships.
c) Impatience and irresponsibility are common characteristics of successful.
d) Problem solving and decision making are types of interpersonal skills.
e) 60-70% of all meaning is derived from non-verbal communication.

Q.2 State the different types of interviews. **10**

Q.3 Discuss the trust factors in high trust organizations and low trust organizations. **10**

Q.4 What is the meaning of empathy? What are the barriers to empathic listening? **10**

Q.5 Write about the essential interview skills. **10**

Q.6 What is entrepreneurship? State the characteristics of successful entrepreneurs. **10**

Q.7 What are interpersonal skills? State the various types required to maintain good relationships. **10**
End Semester Examination, Dec. 2018
BCA / B. Sc. (Information Technology) — Second Semester
ENVIRONMENTAL STUDIES (CH-202B)

Time: 3 hrs. Max Marks: 100
No. of pages: 1

Note: Attempt FIVE questions in all; Q.1 is compulsory. Attempt any TWO questions from PART-A and TWO questions from PART-B. Marks are indicated against each question.

Q.1 Answer the following questions:
   a) What are biotic and abiotic factors?
   b) Explain the reasons of desertification.
   c) Explain hotspot of biodiversity with examples.
   d) Define “Poaching”.
   e) Discuss the sources of water pollution.
   f) What is the reason behind the blackening of Taj Mahal?
   g) Define “Bio-magnification”.
   h) Write the major green-house gases.
   i) What is Environment Protection Act?
   j) What was chipko movement? 2x10

PART-A

Q.2 a) What are the processes that autotrophic organisms use to produce organic material from inorganic substances? 2
   b) Explain the food web of forest and aquatic ecosystems. 10
   c) Discuss the causes of deforestation. 8

Q.3 Define the following terms:
   a) Sustainability. 5
   b) 3R principle. 10
   c) Sustainable environment. 5

Q.4 a) Discuss the different treats to biodiversity. 10
   b) Differentiate in-situ and ex-situ biodiversity conservation with examples. 10

PART-B

Q.5 What do you understand by global warming? How it is caused and what is the protocol to control global warming? Discuss the protocol. 20

Q.6 How many types of solid wastes are present in environment and what are their harmful effects? How these can be managed? 20

Q.7 a) Differentiate between BWC and CWC. 8
   b) Discuss “Chipko Movement” in detail. 12
End Semester Examination, Dec. 2018
BCA – Fifth Semester
ENTREPRENEURSHIP DEVELOPMENT (COM-O306)

Time: 3 hrs. Max Marks: 100
No. of pages: 1

Note: Attempt FIVE questions in all; Q.1 is compulsory. Attempt any TWO questions from Part-A and TWO questions from Part-B. Marks are indicated against each question.

Q.1 Write short notes on (any four) of the following:
   a) Differentiate between entrepreneur and manager.
   b) What are the problems faced by women entrepreneurs?
   c) Briefly explain the theories of entrepreneurial motivation.
   d) Differentiate between management and administration.
   e) Explain the terms shares, debentures and bonds. 5×4

PART-A

Q.2 Describe the different forms of business and state the importance of generating new business idea. 20

Q.3 What do you mean by the term entrepreneur? Explain the qualities of a successful entrepreneur and distinguish between entrepreneur and manager. 20

Q.4 Discuss the role of government and SHGs in the development of women entrepreneurs. 20

PART-B

Q.5 What sort of risks any start up faces and what are the methods to assess it? 20

Q.6 ‘Finance is the life blood of business’. Explain the role and importance of finance for a new venture. 20

Q.7 Describe the process of project launching. Prepare an outline of the preliminary project report for setting up a ‘fitness centre’. 20
End Semester Examination, Dec. 2018  
B. Sc. (Data Science) - First Semester  
STATISTICS-I (DS-101)  

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

Note: Attempt **FIVE** questions in all; **Q.1 is compulsory**. Attempt any **TWO** questions from **Part-A** and **TWO** questions from **Part-B**. Marks are indicated against each question.

**Q.1** Answer the following questions:

a) Using Ogive we can determine a particular measure of central tendency, namely __________.

b) For drawing Histograms, the class interval should be _____________.

c) What are the corrections for the first four moments?

d) Find the AM and GM of the first n natural numbers.

e) Relation between moment about mean and moment about a number.

f) Determine the value of median from the following series:

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of students</td>
<td>7</td>
<td>5</td>
<td>8</td>
<td>38</td>
<td>42</td>
</tr>
</tbody>
</table>


g) Can two uncorrelated variable be independent

h) If the regression coefficients are 0.6 and 0.4, find correlation coefficients.

i) Distinguish between Multiple and Partial Correlation.


**PART-A**

**Q.2** The following data relate to loan advance to 40 farmers by the Co-operative Bank (the figures are in hundred rupees):

<table>
<thead>
<tr>
<th>Values</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>8</td>
</tr>
<tr>
<td>18</td>
<td>10</td>
</tr>
<tr>
<td>13</td>
<td>9</td>
</tr>
<tr>
<td>16</td>
<td>5</td>
</tr>
<tr>
<td>14</td>
<td>12</td>
</tr>
<tr>
<td>14</td>
<td>10</td>
</tr>
<tr>
<td>16</td>
<td>20</td>
</tr>
<tr>
<td>15</td>
<td>14</td>
</tr>
<tr>
<td>17</td>
<td>17</td>
</tr>
<tr>
<td>18</td>
<td>19</td>
</tr>
<tr>
<td>11</td>
<td>15</td>
</tr>
<tr>
<td>5</td>
<td>9</td>
</tr>
</tbody>
</table>

i) Construct a frequency table taking 5 as the class interval.

ii) Draw increasing and decreasing ogives: what is the significance of their point of intersection?


**Q.3**

a) Draw a histogram and frequency polygon from the following table:

<table>
<thead>
<tr>
<th>Marks</th>
<th>0 – 10</th>
<th>10 – 20</th>
<th>20 – 30</th>
<th>30 – 40</th>
<th>40 – 50</th>
<th>50 – 60</th>
<th>60 – 70</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of students</td>
<td>4</td>
<td>8</td>
<td>11</td>
<td>15</td>
<td>12</td>
<td>7</td>
<td>3</td>
</tr>
</tbody>
</table>

b) Draw a stem and leaf diagram using the set of data below:

| 148 | 147 | 145 | 103 | 113 |
| 135 | 93  | 87  | 111 | 110 |
| 119 | 107 | 113 | 110 | 104 |


**Q.4**

a) Obtain the Karl Pearson’s measure of Skewness for the following data:

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency</td>
<td>6</td>
<td>8</td>
<td>17</td>
<td>21</td>
<td>15</td>
<td>11</td>
<td>2</td>
</tr>
</tbody>
</table>

b) Standard deviation is the best measure of dispersion, why?
Q.5 Find the Kurtosis based on moments for the following distribution:

<table>
<thead>
<tr>
<th>Marks:</th>
<th>0 – 10</th>
<th>10 – 20</th>
<th>20 – 30</th>
<th>30 – 40</th>
<th>40 – 50</th>
<th>50 – 60</th>
<th>60 – 70</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of students:</td>
<td>8</td>
<td>12</td>
<td>20</td>
<td>30</td>
<td>15</td>
<td>10</td>
<td>5</td>
</tr>
</tbody>
</table>

15

**PART-B**

Q.6 Ten students got the following percentage of marks in Economics and Statistics. Calculate the coefficient of correlation.

<table>
<thead>
<tr>
<th>Marks in Economics:</th>
<th>78</th>
<th>36</th>
<th>98</th>
<th>25</th>
<th>75</th>
<th>82</th>
<th>90</th>
<th>62</th>
<th>39</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marks in Statistics:</td>
<td>84</td>
<td>51</td>
<td>91</td>
<td>60</td>
<td>68</td>
<td>62</td>
<td>86</td>
<td>58</td>
<td>47</td>
</tr>
</tbody>
</table>

15

Q.7 a) Show that the limit of correlation coefficients is {-1, 1}.

b) Establish the formula \( r = \frac{\sigma_x^2 + \sigma_y^2 - \sigma_{x-y}^2}{2\sigma_x \sigma_y} \), where \( r \) is the coefficient of correlation between \( x \) and \( y \) and \( \sigma_x, \sigma_y \) and \( \sigma_{x-y} \) are concerned standard deviations.

5

Q.8 Calculate the line of regression of \( x \) and \( y \) coefficients from the following table:

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>( x )</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>( y )</td>
<td>7</td>
<td>10</td>
<td>12</td>
<td>14</td>
<td>17</td>
<td>20</td>
<td>24</td>
<td>28</td>
</tr>
</tbody>
</table>

15

Q.9 a) Establish the formula for angle between two lines of regression, \( \tan \theta = \frac{1 - r^2}{r} \cdot \frac{\sigma_x \sigma_y}{\sigma_x^2 + \sigma_y^2} \), where \( r \) is the coefficient of correlation and \( \sigma_x \) and \( \sigma_y \) are concerned standard deviations.

b) Given that \( b_{xy} = 0.25 \), \( \text{var}(x) = 4 \), \( \text{var}(y) = 36 \), find the correlation between \( x \) and \( y \).
Q.1
a) Explain $\tan^{-1} x$ in powers of $x$. 

b) If $z = x \log y$, show that $\frac{\partial^2 z}{\partial x \partial y} = \frac{\partial^2 z}{\partial y \partial x}$. 

c) Show that $\Gamma\left(\frac{1}{2}\right) = \sqrt{\pi}$. 

d) $\Gamma(n+1) = n!$ 

e) Give the negation of the following statement. 
   i) $p: 2 + 3 > 1$ 
   ii) $q: it is cold$ 

f) The truth value of given statement is 'If 9 is prime then 3 is even'. 
   a) False 
   b) True 

g) Let $A = \{a, b, c\}, B = \{d, e\}, C = \{a, d\}$. Find $(A \cap B) \times C$. 

Q.2
a) Find the graph that has the following adjacency matrix: 

$$
\begin{bmatrix}
1 & 2 & 1 & 2 \\
2 & 0 & 2 & 1 \\
1 & 2 & 1 & 0 \\
2 & 1 & 0 & 0
\end{bmatrix}
$$ 

b) Find a Hamiltonian circuit of minimal weight for the graph shown below:

Q.3
Find the shortest path from $s$ to $t$ and its length for the given below:
Q.4  a) Form the conjunction of \( p \) and \( q \) for each of the following:
   i) \( p \): it is snowing \( q \): I am cold
   ii) \( p: 2 < 3 \) \( q: -5 > -8 \)
   iii) \( p \): it is snowing \( q: 3 < 5 \)

b) Form the disjunction of \( p \) and \( q \) for each of the following:
   i) \( p: 2 \) is a positive integer \( q: \sqrt{2} \) is a rational number
   ii) \( p: 2 + 3 = 5 \) \( q: \) London is Capital of France

Q.5  Find the truth value of each proposition if and only if \( p \) and \( r \) true and \( q \) is false.
   a) \( p \land q \)
   b) \( p \land (q \lor r) \)

PART-B

Q.6  a) Show that the function \( u = xy + \frac{a^3}{x} + \frac{a^3}{y} \) has a minimum value at \((a, a)\).

b) If \( x^a + y^b = a^b \), find \( \frac{dy}{dx} \).

Q.7  a) Explain \( e^y \) at \((1, 1)\) in powers of \((x-1)\) and \((y-1)\).

b) If \( u = x + y + z, uv = y + z, \) and \( uw = z, \) show that \( \frac{\partial(x, y, z)}{\partial(u, v, w)} = u^2v \).

Q.8  a) Evaluate \( \int\int x^2y^2 \, dx \, dy \) over the circle \( x^2 + y^2 \leq 1 \).

b) Change the order of integration \( \int\int \phi(x, y) \, dx \, dy \)

Q.9  a) Find the area bounded by the parabolas \( y^2 = 4 - x \) and \( x^2 = 4 - 4x \).

b) Relation between Beta and Gamma functions.
End Semester Examination, Dec. 2018
B. Sc. (Data Science) – First Semester
PROGRAMMING IN C (DS-103)

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. Marks are indicated against each question.

Q.1 a) What is ASCII code? Explain their importance in computers.
b) Draw a flowchart for finding percentage of marks in six subjects.
c) Define 'recursion'. Explain its importance with a suitable example.
d) Differentiate between compiler and interpreter.
e) What is a ternary operator(?)? Give suitable example.

UNIT-I

Q.2 Convert the following:
a) \((11000111)_2 \rightarrow (?)_4\)
b) \((1101001)_2 \rightarrow (?)_4\)
c) \((4ADB6C)_{16} \rightarrow (?)_{10}\)
d) \((34256)_{10} \rightarrow (?)_2\)
e) \((546)_{10} \rightarrow (?)_2\)
f) \((10110100)_2 \rightarrow (?)_{16}\)
g) \((10110010.011)_2 \rightarrow (?)_{10}\)

UNIT-II

Q.3 a) State the block diagram of a computer system. Explain the functions of different components of computer system.
b) Draw a flowchart to illustrate the logic for converting a number from base (10) to a new base using the division remainder technique.

Q.4 a) Write a program that accepts positive integer from user and prints “ODD” or “EVEN” as an output based on the value to the number.
b) Write a program to swap values of two variables without using a third variable.
c) List the fundamental data types along with their minimum stipulated size.

Q.5 a) Consider the following rates charged by a mobile operator for data packs in integral units of GB:

<table>
<thead>
<tr>
<th>Data usage (GB)</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 GB</td>
<td>₹148</td>
</tr>
<tr>
<td>2 GB</td>
<td>₹255</td>
</tr>
<tr>
<td>3 GB</td>
<td>₹355</td>
</tr>
<tr>
<td>4 -6 GB</td>
<td>₹455</td>
</tr>
<tr>
<td>7 GB onwards</td>
<td>₹700</td>
</tr>
</tbody>
</table>

Write a program using switch case-that an integer from keyboard and prints the corresponding rate after validation.
b) Define an array. Write a program that read a square matrix from the user and display its transpose.

UNIT-III

Q.6 a) Discuss function prototype, function call and function definition by taking suitable examples.  
    b) Differentiate between iterative and recursive functions with examples.

Q.7 a) Write a function prime that returns one (1) if its argument is a prime number and return zero (0) otherwise.
    b) Define a structure personal which contain person-name, date-of-joining and salary. Using this structure write a program for reading information of one person from the user and display it on the screen.

UNIT-IV

Q.8 a) What is a printer? How do we declare a pointer? Write mechanism of accessing variables through pointers.
    b) Write a program to swap values of two variables by passing them as a reference to a function [use of pointer].

Q.9 a) Explain any four functions described in string-h header file with examples.
    b) Describe puts( ) and gets( ) functions on strings by taking suitable examples.
Q.1  

a) A printed circuit board has 8 different locations in which a component can be placed. If 4 different components are to be placed on the board, how many different designs are possible?  

b) If \( P(A/B) = 0.2, P(A/B') = 0.3 \) and \( P(B) = 0.8 \). What is \( P(A) \)?  

c) In a voice communication system with 50 lines, the random variable is the number of lines in use at a particular time. Determine the range of random variable.  

d) The number of e-mail messages received per hour has the following distribution:  

<table>
<thead>
<tr>
<th>x = No. of Messages</th>
<th>10</th>
<th>11</th>
<th>12</th>
<th>13</th>
<th>14</th>
<th>15</th>
</tr>
</thead>
<tbody>
<tr>
<td>F(x)</td>
<td>0.08</td>
<td>0.15</td>
<td>0.30</td>
<td>0.20</td>
<td>0.20</td>
<td>0.07</td>
</tr>
</tbody>
</table>

i) Determine the mean of the number of messages received per hour.  

ii) Determine the standard deviation of the number of messages received per hour.  

UNIT-I  

Q.2  

a) Orders of a computer are summarised by the optional features that are requested as follows:  

| No Optional feature | Proportion of Orders  | 0.3  |  
| One Optional feature | 0.5  |  
| More than one Optional feature | 0.2  |  

i) What is the probability than an order requests at least one optional feature?  

ii) What is the probability than an order does not request more than one optional feature.  

b) If A, B, C are mutually exclusive events with \( P(A) = 0.2, P(B) = 0.3 \) and \( P(C) = 0.4 \), determine the following:  

i) \( P(A \cup B \cup C) \)  

ii) \( P(A \cap B \cap C) \)  

iii) \( P((A \cup B) \cap C) \)  

Q.3  

The analysis of shafts for a compressor is summarized by conformance to specifications:  

<table>
<thead>
<tr>
<th>Surface finish Conform</th>
<th>Roundness Conforms</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>345</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>12</td>
<td>8</td>
<td></td>
</tr>
</tbody>
</table>

a) If a shaft is selected at random then what is the probability that it conforms to surface finish requirements?  

b) What is the probability that the selected shaft conforms to surface finish requirements or to roundness requirements.
c) What is the probability that selected shaft conforms to both surface finish and roundness requirements.

UNIT-II

Q.4 A lot of 100 semiconductor chips contains 20 defective chips and 2 are selected randomly, without replacement from the lot.

a) What is the probability that the first one selected is defective?
b) What is the probability that the second one selected is defective given that the first one was defective?
c) What is the probability that both are defective?
d) How does the answer to part (b) change if chips selected were replaced prior to the next selection?

Q.5 a) An email filter is planned to separate valid e-mails from spam. The word 'free' occurs in 60% of the spam messages and only 4% of the valid messages. Also 20% of the messages are spam. Determine the following probabilities:
   i) The message contains 'free'
   ii) The message is spam given that it contain 'free'
   iii) The message is valid given that it doesn’t contain 'free'

b) If \( P(A/B)=0.4, P(B)=0.8 \) and \( P(A)=0.5 \). Are the events \( A \) and \( B \) independent?

UNIT-III

Q.6 a) From the following data; verify that the functions given are probability mass functions, and also determine the requested probabilities:

<table>
<thead>
<tr>
<th>( x )</th>
<th>-2</th>
<th>-1</th>
<th>0</th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>( F(x) )</td>
<td>0.2</td>
<td>0.4</td>
<td>0.1</td>
<td>0.2</td>
<td>0.1</td>
</tr>
</tbody>
</table>

   i) \( P(x\leq2) \)
   ii) \( P(x>-2) \)
   iii) \( P(-1\leq x \leq1) \)
   iv) \( P(x\leq-1 \text{ or } x=2) \)

b) \( f(x) = \frac{2x+1}{25}, x=0, 1, 2, 3, 4 \)

   i) \( P(x=4) \)
   ii) \( P(x\leq1) \)
   iii) \( P(2\leq x <4) \)
   iv) \( P(x>-10) \)

Q.7 a) Two new product designs are to be compared on the basis of revenue potential. Marketing believes that the revenue from design A can be predicted quite accurately to be $3 millions. The revenue from design B will be $7 million with probability 0.3, but there is 0.7 probability that the revenue will be only $2 million. Marketing concludes that revenue potential of design B is more difficult to assess. Which design do you prefer?

b) Determine the probability mass function of \( x \) from the given cumulative distribution function:
UNIT-IV

Q.8  a) Each sample of water has a 10% chance of containing a particular organic pollutant. Assume that the samples are independent with regard to the presence of the pollutant. Find the probability that in the next 18 samples, exactly 2 contain the pollutant.

b) Suppose that the current measurements in a strip of wire are assumed to follow a normal distribution with a mean of 10 milliamperes and a variance of \( 4(\text{milliamperes})^2 \). What is the probability that a measurement exceeds 13 milliamperes? Given: \( P(Z \leq 1.5) = 0.93319 \)

Q.9  a) In a large corporate computer network, user log-ons to the system can be modeled as a poisson process with a mean of 25 log-ons per hour. What is the probability that there are no log-ons in an interval of six minutes?

b) Suppose that \( x \) has an exponential distribution with \( \lambda = 2 \). Determine the following:
  i) \( p(x \leq 0) \)  
  ii) \( p(x \geq 2) \)  
  iii) \( p(x \leq 1) \)  
  iv) \( p(1 < x < 2) \)
A Taste of Heaven?

1. Jessie Lott suffered a massive cardiac arrest (otherwise known as a heart attack). While the doctors struggled to get her heart beating again she says that she left her body. "I was looking down, and I saw my body, and I saw the doctors. The next thing I can recall is being in a tunnel and moving towards a bright light. The light got bigger and bigger, and then I was in a place of brilliant, beautiful life. The sense of peacefulness was indescribable."

2. Jessie is one of 344 heart-attack victims who were interviewed about the experiences they had had while they were being revived. The study, published in the prestigious scientific journal “The Lancet”, revealed that 18% could recall similar experiences. Jessie Lott’s story is typical because it includes the out-of-the-body experience, the feeling of euphoria and the journey through a tunnel towards a bright light that crop up repeatedly in accounts of what are commonly known as near-death experiences (NDEs).

3. The fact that some people have these experiences is undeniable; the question, though, is: what are we to make of them? Joyce Hawkes, who had a near-death experience when she was knocked unconscious by a falling roof tile, is convinced that she was given a glimpse of a life beyond death. Previously she had been a cell biologist to whom the idea of a spiritual reality had seemed to be nonsense. Her NDE changed all that. "What I learned was that there truly is no death, that there is a change in state from a physical form to a spiritual form, and that there's nothing to fear about that transition," she said. She has since abandoned her career as a biologist and now works as a spiritual healer.

4. Some people remain sceptical, however. Susan Blackmore, a psychology professor at a University in Bristol (UK), argues that the apparent journey through a tunnel towards a bright light is a perfectly understandable consequence of what happens in the visual cortex of the brain when it is starved of oxygen.

5. Medical scientists have also known since the mid-1990s that the drug ketamine (sometimes used as an anaesthetic) can induce experiences which have all the features described by people like Jessie Lott and Joyce Hawkes, including the experience of drifting away from the body. There are also indications that a chemical acting just like ketamine is released in relatively large quantities when the oxygen level in the brain is dangerously low (a state known as cerebral anoxia). The conclusion of Dr Karl Jansen, a psychiatrist in London, is that those claiming to have “returned from death” may have been very close to death but they did not die. Their
experience was not a glimpse of another reality. It was simply an altered state of consciousness triggered by chemical changes in the brain.

6. Arguments like this did not entirely convince the Dutch researchers who interviewed the 344 heart-attack victims. They insisted that the near-death experiences are different from ketamine-induced experiences in one important respect: only the former changed the lives of the people who had them. Although the evidence is very limited, it supports the view that only genuine NDEs can lead to marked changes in people’s personalities, often involving losing the fear of death, and becoming more compassionate and loving. One heart-attack victim, Dianne Morrissey, said, “Since the experience I have been living my life with so much more enjoyment and appreciation. I live my life a hundred percent more now, and yet it is as if I can hardly wait to die. It’s not that I have a death wish. It’s just that I know now how tranquil things will be afterwards.”

**a) Answer the following questions:**

1) Which three events or elements are commonly included in an NDE?.

2) How does Susan Blackmore account for the experience of travelling through a tunnel?

3) If Dr Karl Jansen and Joyce Hawkes met up for a cup of coffee and a chat about NDEs, what do you think would be the most important issue about which they would fail to agree?

4) What is cerebral anoxia?

5) People like Dr Jansen think chemicals like ketamine can explain everything. What do the Dutch researchers think it cannot explain?

**b) Look for words or phrases having the following meanings. (The numbers in brackets refer to the paragraph numbers.)**

1. tried hard (1) ____________.

2. widely admired, held in high esteem (2) ____________.

3. stories, reports (2) ____________.

4. a brief look (3) ____________.

5. According to Joyce, there are two kinds of reality: material and ____________ (3)

6. change (3) ____________.

7. When something is not supplied with what it needs, it is ____________ (4)

8. cause (two verbs in paragraph 5 in different tenses) ____________, ____________.

9. moving slowly, floating without any means of controlling the direction (5) ____________.

10. very sensitive to the suffering of others (6) ____________.

**c) Paraphrase the last paragraph of the passage in your own words.**

Q.2 Read the passage and answer the following questions:

There is still no consensus about how the Neanderthals were driven to extinction, leaving our Homo sapien ancestors without any competition. The disappearance of the native European Neanderthals is odd partly because their shorter, stockier bodies must have made them better able to withstand the colder temperatures that
prevailed when their cousins from Africa entered Europe. With a smaller surface area the Neanderthal body would have been able to retain more heat. The once common assumption that the key was the inferior vocal abilities of the Neanderthal has since been disproved by research on the Neanderthal hyoid bone, located in the throat. The larger skull capacity and brain is another respect in which they do not seem to have been inferior.

It was once thought that proof of a superior intellect was to be found in the narrower Homo sapien stone tools known as 'blades', which were assumed to be more efficient than the broader 'flakes' used by the Neanderthals. In a number of important respects, including durability, this idea has proved to be unfounded. However, the blades would have been more effective as tips for throwing spears whereas the stone flakes would have been limited to the kind of thrusting spears the Neanderthals are believed to have used. This could have combined with the greater agility of the Homo sapiens to give them a distinct advantage in hunting in open terrain. Crucial in this respect were the larger canals in the Homo sapien inner ear, providing a more acute sense of balance, in addition to the longer limbs and lighter build. The Neanderthal technique of hiding and lying in wait for passing animals ceased to be viable when the dense forests of Europe began to recede. After a period of co-existence with their cousins, the Neanderthals were slowly eradicated.

a) Choose the correct option:
1. According to the passage, what is now believed about the stone tools used by the Neanderthals compared to those of the Homo sapiens?
   i) They were at least as long lasting. 
   ii) They could not have been used as spear tips. 
   iii) They were longer and narrower. 
   iv) They indicate a superior mental capacity 
2. The passage states that the Neanderthals relied on the dense forests.
   i) for firewood and shelter. 
   ii) to provide cover when hunting. 
   iii) to provide wood for spears. 
   iv) to hide from their attackers. 
3. The hyoid bone is evidence of
   i) a capacity for language. 
   ii) an ability to adapt to a cold climate. 
   iii) skull capacity. 
   iv) the inferior anatomy of the Neanderthal. 
4. The Neanderthals were wiped out
   i) before the Homo sapiens arrived. 
   ii) in battles with their opponents. 
   iii) after the climate changed. 
   iv) due to their primitive social organization. 
5. According to the passage, which of the following is NOT an older assumption that has now been cast in doubt?
   i) Neanderthals were considerably less intelligent than Homo sapiens. 
   ii) The Neanderthals evolved first in Africa. 
   iii) Flakes were inferior to blades in all respects. 
   iv) Neanderthals had very poor communication skills. 

b) Summarize the reading passage in not more than 100 words.
Section B: Grammar And Vocabulary

Q.3 Fill in the blanks with the correct tense:
   i) The boys were playing games when it ___________ (was starting/started/had started) raining.
   ii) You were watching TV when I _____________ (prepared/am preparing/was preparing) for my exam.
   iii) The phone ___________ (rings/rang/was ringing) while I was cooking dinner.
   iv) How long ___________ (have you been/are you/were you) a social activist?
   v) We ______________ (knew/are knowing/have known) each other for a long time.
   vi) We ______________ (are learning/have learnt/learnt) nothing from all the wars in history.
   vii) I ______________ (prepared/have prepared/had prepared) well for the exam.
   viii) I ______________ (prepared/have prepared/was preparing) well for the exam, yet I failed.
   ix) The teacher __________(asks/has asked/asked) an interesting question in the class yesterday.
   x) I looked around but I ____________ (didn’t find/hadn’t found/don’t find) anyone.
   xi) She threw a glass at me, but ____________ (was missing/missed/had missed).
   xii) If you don’t hurry, you ____________ (will miss/would miss/missed) the train.

Q.4 Choose the correct synonym for the words given below:

<table>
<thead>
<tr>
<th>Grasp</th>
<th>Amazing</th>
<th>Wrong</th>
<th>hurry</th>
<th>story</th>
<th>difficulty</th>
</tr>
</thead>
</table>
   i)   | Erroneous __________________________ |
   ii)  | Seize ______________________________ |
   iii) | Fable ______________________________ |
   iv)  | Dash ________________________________ |
   v)   | Predicament ________________________ |
   vi)  | Stupendous __________________________ |

Q.5 Choose the correct option to fill in the blank:
   i) The army lost the battle because ___________(it/them/they) was not strong.
   ii) My parents are coming. I’ll open the door for ___________(they/them/his)
   iii) I checked the answers. Two of ___________ (them/they/his) were wrong.
   iv) Betty goes to a ____________(girl’s/girls/girls’) school.
   v) Is a fly ___________(a/an/X) insect?
   vi) She works as ___________(a/the/X) clerk in a very large bank.

Section C: Writing

Q.6 With a fast pace of modern life more and more people are turning towards fast food for
their main meals. Do you think the advantages outweigh the disadvantages? Write your views in about 250 words.

Q.7 Some countries encourage teenagers to have part-time jobs and see it as a good thing, while others disagree. Give your opinion and explain both views. (200-250 words)
A Planning Process for Middle-Sized Projects

Any business project - such as reducing energy cost, or improving efficiency - needs to be planned, and time spent planning will save far more time later on. The typical stages in this planning process are explained below.

Your first task is to spot what needs to be done. Examine your firm's current position, perhaps making a formal analysis of its strengths and weaknesses. Then think about how you might improve that position: what opportunities are there for achieving this.

The next step is to decide precisely what the aim of your plan is. This is best expressed in a simple single sentence, to ensure that it is clear and sharp in your mind. Doing this helps you to avoid wasting effort on irrelevant side issues.

Next you should work out how to do it. It is tempting just to grasp the first idea that comes to mind, but it is better to consider a wide range of options: this way you may come up with less obvious but better solutions.

Once you have explored the options available to you, the selection of which option to use is the next step. If you have the time and resources, you might decide to evaluate all options, carrying out some planning, such as costing, for each. Normally you will not have this luxury.

You already have a broad idea of what your project will consist of. Now is the time to work out the full details, identifying the most efficient and effective method of carrying it out, including answering of ‘who’, ‘what’ and ‘when’.

The next stage is to review your plan and decide whether it will work satisfactorily, it is time for implementation. Your plan will cover how this to be done.

Once you have achieved a plan, you can close the project. At this point it is often worth assessing the project to see whether there are lessons that you can learn.

Complete the flow chart below:
Choose ONE WORD ONLY from the text for each answer.

Start by identifying opportunities for making improvements to current situation

Decide and define the plan’s exact ____________________

Identify and consider a ________________ of possible solution

Make a __________________________ from possible solutions
Q.2 Match the following words with their antonyms.

<table>
<thead>
<tr>
<th>Contraction</th>
<th>detached</th>
<th>Join</th>
<th>ambitious</th>
<th>alive</th>
<th>Exciting</th>
<th>quarrelsome</th>
<th>endless</th>
<th>traditional</th>
<th>determined</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) to separate, not to take part in</td>
<td>b) boring</td>
<td>c) long form, expansion</td>
<td>d) innovative</td>
<td>e) connected</td>
<td>f) dead</td>
<td>g) finite</td>
<td>h) not be able to take decisions</td>
<td>i) unmotivated</td>
<td>j) amiable</td>
</tr>
</tbody>
</table>

Q.3 Writing Task 1: Write about the following topic:
Modern lifestyles mean that many parents have little time for their children. Many children suffer because they do not get as much attention from their parents as children did in the past.
Do you agree or disagree?
Write at least 200 words.

Q.4 Writing task two:
The chart below gives information about the most common sports played in New Zealand in 2002.
Summarize the information by selecting and reporting the main features, and make comparisons where relevant.
Write at least 150 words.
Q.1 Multiple choice questions/short answer questions:

a) A customer purchased candies for her kid but the kid got sick on eating them, furious, she complained to the company by posting on their Facebook page and asked other pages to avoid purchasing these candies. What action do you think the company should take?
   i) They should delete the comments and ban her for spreading negativity about the company.
   ii) They should simply ignore the comment as one on two negative comments don’t make any difference to the brand image.
   iii) They should defend themselves aggressively telling her to shut up.
   iv) They should apologize, take her phone number and try to speak to her to resolve the matter.

b) Companies that practice online marketing into their traditional operations are classified as:
   i) Premium companies.
   ii) Direct companies.
   iii) Click only companies.
   iv) Click and mortar companies.

c) Which of the following is not a standard in online advertising?
   i) Static banners
   ii) Dynamic banners
   iii) Referrals links
   iv) Signal
   v) Banner

d) What is unique about social media marketing?
   i) Can combine game and other elements.
   ii) Interactive communication
   iii) Generates contacts quickly.
   iv) All of these.

e) Which of the following marketing techniques are most likely to pay you.
   i) Pay per click advertising
   ii) Using social media marketing strategies
   iii) Posting press releases
   iv) Article marketing

f) Which of the following is not an issue that marketers need to consider when using digital resources for marketing activities?
   i) Jurisdiction
   ii) Disclosure
   iii) Ownership
   iv) Permissions.
g) Which of the following is not one of major considerations when using internet advertising to increase brand awareness and encourage click-through to a target site?
   i) Cost  ii) Intrusive  iii) Interactively  iv) timeliness

h) This operates algorithmically or using a mixture of algorithmic and human input to collect index, store and retrieve information on the web (e.g. web pages, the information available to users in a manageable and meaningful way in response to a search query. This is referred to as:
   i) Banner ads  ii) Pop-up ads  iii) A search engine  iv) Apps

i) Reviews are a major part of any business’s online presence. The majority of online consumers will read about 10 reviews before they can truly trust a business or product online. (True/False)

j) The most effective online marketing tool according to over 68% of small business is:
   i) Phone book  ii) Social media  iii) Websites  iv) SEO

**PART-A**

Q.2 “Digital marketing is all about brand marketing tactics via the online channels”. What do you understand from this statement? Name the various methods and techniques it includes. Name the segments in which you can categorize digital marketing. What is the scope of the same?  

Q.3 Write notes on:
   a) Search engine page results.
   b) Working of Google.  

Q.4 How can you drag the attention of more and more number of potential buyers for the products/services offered by your service via Facebook or any other social media forum? Discuss. 

**PART-B**

Q.5 How much do you agree with this statement “Online advertisement has become increasingly invasive”? Overall, do you think online ads have a positive or negative impact on the buyer? Discuss. 

Q.6 Do a web marketing manager play a pivotal role in digital marketing? What are his role and responsibilities? How does digital marketing plan come into action? Discuss in detail.

Q.7 Write short notes on the following:
   a) Pros and Cons of online shopping.
   b) Internet marketing techniques.
   c) Personalization e-com.
   d) The e-cycle of internet marketing.
Q.1  a) Answer the following multiple choice questions:
   i) Organization structure primarily refers to:
      e) How activities are activated and controlled?
      f) How resources are allocated?
      g) Policy statements developed by firms.  
   ii) Forces affecting organizational behavior are:
      ix) People.
      x) Environment.
      xi) Technology.
      xii) All of the above.  
   iii) In present context challenges for organizational behavior are:
      e) Employee expectation.
      f) Workforce diversity.
      g) Globalization.
      h) All of the above.  
   iv) Effective managers who achieve goals in "steady state" conditions by clarifying
      role and task requirements are called:
      e) Transformational leaders.
      f) Charismatic leaders.
      g) Action centered leaders.
      h) Transactional leaders.  

b) Fill in the blanks:
   i) _________ is known as "Father of scientific management".
   ii) Scientist of organizational behavior recognize that organizations are not static
      but dynamic and _________.
   iii) Leadership is the art or process of influencing people so that they will strive
      willingly towards the achievement of _________.
   iv) Leadership exists in every organization whether ________.  

c) State whether the following statement are True or False:
   i) A participative leader will always be a good communicator.
   ii) When informal leaders emerge in a work situation, the manager job become
difficult.  

PART-A

Q.2  "Since organizational behavior is a common sense, there is no need to study OB". Do
you agree with this statement? Give reason for your answer.  

Q.3  Explain the need and importance of motivation in an organization.  


PART-B
Q.5 Explain the various dimensions of organizational culture. How it can be improved? Discuss in detail.

Q.6 Discuss various theories of leadership.

Q.7 Define “Leadership”. Why a good leader cannot be a good manager? Elucidate in detail.
End Semester Examination, Dec. 2018  
MCA — Fifth Semester  
HR MANAGEMENT (MCA-006CB)  

Time: 3 hrs.  
Max Marks: 50  
No. of pages: 1  

Note: Attempt FIVE questions in all; Q.1 is compulsory. Attempt any TWO questions from PART-A and TWO questions from PART-B. Marks are indicated against each question.

Q.1 Answer the following question:  
  a) What do you understand by term “human resource management”?  
  b) What is the importance of HRIS system?  
  c) Discuss the term job analysis and job evaluation.  
  d) Define the term redundancy.  
  e) Explain the importance of human resources planning in H.R. management.  

**PART-A**  

Q.2 What are the various steps involve in the recruitment of any employee also list different sources of recruitment.  

Q.3 What are the roles of training in employee’s professional in an organization. Also discuss the personnel development of an employee.  

Q.4 Write short notes on the following:  
  a) Career development.  
  b) Methods of incentive plan.  

**PART-B**  

Q.5 What is the significance of employee health and safety in any organization? Also, discuss the various acts regarding the health of industrial workers.  

Q.6 Discuss various methods of wages payment.  

Q.7 Write short notes on the following:  
  a) Trade unionism.  
  b) Social security.
Q.1 Multiple choice questions:
   a) Which device is required for the internet connection?
      i) Joystick.   ii) Modem.
      iii) CD drive. iv) NIC card.
   b) A computer cannot boot if it does not have:
      i) Compiler.  ii) Operating system.
      iii) Loader.  iv) Assembler.
   c) In which language is source program written?
      i) English. ii) Symbolic.
      iii) High level. iv) None of the above.
   d) A daisy wheel is a type of:
      i) Printer. ii) Plotter.
      iii) Scanner. iv) Memory.
   e) A byte consist of:
      i) One bit. ii) Four bit.
      iii) Eight bit. iv) Sixteen bit.
   f) Algorithm and flowcharts are used to prepare results:
      i) True. ii) False.
   g) Syntax error are detected by compilers:
      i) True. ii) False.
   h) Cache memory is a non volatile memory:
      i) True. ii) False.
   i) A computer can only understand machine language and no other language:
      i) True. ii) False.
   j) Printer is a secondary storage device:
      i) True. ii) False.

**PART-A**

Q.2 a) In your opinion explain why cache memory is important in computer system?  

b) Write short notes on the following:
   i) Electronic pen.  ii) Plotter.
   iii) Trackball. iv) Joystick.
   v) Notepad (Tablets).

**Q.3**

a) What are the characteristics of a good programming language?  

b) In your opinion explain what are the differences between procedural and object oriented language? 

**Q.4**

a) What are open source software’s and what is their importance in the current scenario?  

b) Differentiate between the following:
   i) System software and application software.
ii) Compiler and Interpreter.

iii) Linker and loader.  

**PART-B**

Q.5  
  a) What do you understand by program designing approach? Explain its relative advantages and disadvantages.  
  
  b) “In a program different types of error can be occurred”. Explain in your point of view.

Q.6  
  Draw a flowchart and also algorithm for checking a number is palindrome or not. Also perform dry run and show the results. (A palindrome number is same when we read from either end ex: 121=121).

Q.7  
  a) Write short notes on the following:
     i) Structured programming.
     ii) Top down approach.
     iii) Bottom up approaches.
  
  b) What is sequences, selection and iteration in program?
End Semester Examination, Dec. 2018
MCA — First Semester
PROGRAMMING IN C (MCA-103A (CB))

Time: 3 hrs.  Max Marks: 100
No. of pages: 2

Note: Attempt **FIVE** questions in all; **Q.1 is compulsory.** Attempt any **TWO** questions from **PART-A** and **TWO** questions from **PART-B.** Marks are indicated against each question.

Q.1  
a) ________ is first operating system designed using ‘C’ programming language:
   i) DOS.
   ii) Windows.
   iii) UNIX.
   iv) None.

b) An array elements are always stored in ________ memory location.
   i) Sequential
   ii) Random
   iii) None.

c) Who is father of ‘C’ language?
   i) James grosling.
   ii) Dr. E.F. Codd.
   iii) Dennis Ritchie.

d) Name the loop that executes atleast on:
   i) for
   ii) if
   iii) do.while
   iv) while

e) A pointer that is pointing to nothing is called ________.
   i) Void
   ii) Wild
   iii) NULL
   iv) None

**State whether the following statements are TRUE or FALSE:**

f) Real is not a correct variable type in ‘C’.

g) ‘B’ language is predecessor to ‘C’ programing language.

h) % f format specifier is used to print the values of float type variable.
   i) Define keyword.
   j) Define variable.

**PART-A**

Q.2  
a) Write a program in ‘C’ to find area of triangle.

b) Discuss with examples:
   i) scanf()
   ii) printf()
   iii) getchar()
   iv) putchar()

Q.3  
Write the format/syntax, purpose and example of following:
a) for statement
b) If-Else
c) Switch
Q.4  a) Define array. What are advantages of array? Explain how arrays are declared and initialized in ‘C’? Give example.  
b) Compare call-by-value and call-by-reference.  

PART-B

Q.5  a) Discuss various methods to pass a pointer in function. Give example.  
b) Discuss various operations on pointers.  

Q.6  a) Write a program to showcase the use of array of union.  
b) How structures are different from union?  

Q.7  a) What do you understand by unformatted data files? Explain with suitable example.  
b) Write a short note on ‘command line arguments’.  

<table>
<thead>
<tr>
<th>Question</th>
<th>Marks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q.4 a)</td>
<td>15</td>
</tr>
<tr>
<td>Q.4 b)</td>
<td>5</td>
</tr>
<tr>
<td>Q.5 a)</td>
<td>10</td>
</tr>
<tr>
<td>Q.5 b)</td>
<td>10</td>
</tr>
<tr>
<td>Q.6 a)</td>
<td>10</td>
</tr>
<tr>
<td>Q.6 b)</td>
<td>10</td>
</tr>
<tr>
<td>Q.7 a)</td>
<td>10</td>
</tr>
<tr>
<td>Q.7 b)</td>
<td>10</td>
</tr>
</tbody>
</table>
Q.1  
a) The format used to present the logic output for various combinations of logic inputs to a gate is called \( a(n) \).
   i) Boolean variable ii) Truth table iii) Input logic function iv) Boolean constant
b) The logic gate that will have high or \( "1" \) as its output when any one of its inputs is high is \( a(n) \).
   i) NOT operation ii) AND gate iii) OR gate iv) NOR gate
c) A small circle on the output of logic gate is used to represent the:
   i) Comparator operation ii) AND operation iii) OR operation iv) EX-OR operation
d) Boolean algebra is define as set of:
   i) One value ii) Two values iii) Three values iv) Four values.
e) Logic gates is a set of input and is an arrangement of:
   i) Combinational circuit ii) Logic circuit iii) Design circuit iv) Register
f) MIMD stands for:
   i) Multiple instruction multiple data. ii) Multiple instruction memory data iii) Memory instruction multiple data iv) Multiple information multiple data.
g) A flip-flop is capable of storing information of:
   i) 1 Bit ii) Byte iii) Zero Bit iv) Eight bit
h) Cache memory acts between:
   i) CPU and RAM ii) RAM and ROM iii) CPU and Hard disk iv) None of these
i) _______ register keeps track of the instruction stored in program stored in memory.
j) There are _______ cells in a 4 variable k-map.
   i) 12 ii) 16 iii) 18 iv) None of these

\[ 2 \times 10 \]

**PART-A**

Q.2  
a) Draw logic circuit diagrams and logic gates for NAND, NOR and exclusive OR gates.

b) Perform following operations:
   i) Covert \( (517)_{16} \) to \( (\quad)_{10} \)
   ii) Covert \( (417 \cdot 25)_{8} \) to \( (\quad)_{2} \)
Q.3 a) If \( F(a,b,c,d) = \sum (0,2,4,5,7,8,10,12,13,15) \) obtain the simplified form using k-map. 

b) Convert \((58 \cdot 43)_{10}\) into its excess -3 code.

c) Encode data bits 0110 into 7-bit even parity hamming code.

Q.4 a) Explain half substractor and full substractor with their block diagram, truth tables and logical circuits.

b) Draw truth table and circuit diagram of 8 by 3 encoder.

**PART-B**


Q.6 a) What is 3-way handshaking? Explain with suitable example.

b) What are instruction formats? Explain different types of instruction formats with proper examples.

Q.7 a) What is memory? What are different characteristics of memory? Describe memory hierarchy with suitable diagram.

b) Write short notes on:
   i) Interrupts.
   ii) Stacks organization.
End Semester Examination, Dec. 2018
MCA - First Semester
MATHEMATICS FOR COMPUTING (MCA-106(CB))

Time: 3 hrs     Max Marks: 100
No. of pages: 2

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

Q.1 Answer the following questions:
   a) Define Non-Terminating Decimals.
   b) Define a linear equation.
   c) What is the general term of a Geometric Progression?
   d) Write Section Formula.
   e) Give one-point form of a straight-line.
   f) \( \sec^2 \theta - ? = 1 \)
   g) \( \sin \left(180^0 + \theta\right) = \text{___________} \)
   h) \( \frac{d}{dx}[uv] = \text{___________} \)
   i) Write Maclaurin’s Theorem.
   j) \( \int a^x \, dx = \text{___________}. \)

PART-A

Q.2 a) State and prove Fundamental Theorem of Arithmetic. 10
b) Prove that \( \sqrt{5} \) is an irrational number. 10

Q.3 a) Solve: \[
5x + 2y = 8 \\
9x - 5y = 23
\] 10
b) Find the sum of series:
   \[
   2 + 3 \frac{1}{2} + 5 + 6 \frac{1}{2} + \ldots \text{ to 25 terms.}
   \] 10

Q.4 a) Short that the points \( (1,-3),(2,0),(2,1)\) and \( (-2,2) \) are vertices of a square. 10
b) Find the equation of the line passing through \( (0,-1) \) and perpendicular to the line joining the points \( (0, 1) \) and \( (3, 5) \). 10

PART-B

Q.5 a) Evaluate: \[
\cos 130^0 \cos 40^0 + \sin 130^0 \sin 40^0
\] 10
b) Prove that:
   \[
   \frac{\cot \theta + \cos \epsilon \theta - 1}{\cot \theta - \cos \epsilon \theta + 1} = \cos \epsilon \theta + \cot \theta
   \] 10

Q.6 a) Differentiate following w.r.t. \( x \)
   i) \( \frac{2x + 3}{x^2 - 5} \)
ii) \( \frac{x + \sin x}{x + \cos x} \)

b) Expand \( \log(1 + x) \) in terms of \( x \) with the help of Maclaurin’s Theorem.

c) State Taylor’s Theorem.

Q.7

a) Integrate: \( \int \frac{1}{\sqrt{5x + 3} + \sqrt{5x + 2}} \, dx \)

b) Integrate: \( \int \frac{1 - \cos x}{1 + \cos x} \, dx \)
Q.1 Answer the following questions:
   a) Explain the term decision and decision making.
   b) “Planning is also a controlling process”. Discuss.
   c) How informal organization differ from formal organization?
   d) Why is training so important for man power development?
   e) What are the scope and importance of strategies?  

   \[Q.1\] \[4\times5\]

Q.2 a) Henry Fayol is regarded as “Father of modern management theory”. What are various groups, in which Industrial activities can be divided, support your answer. \[10\]
   b) “Management is an art of getting work done through people”. Explain various functions of management in light of this statement. \[10\]

Q.3 a) What are the major steps that should be included in the planning process of an organization? \[10\]
   b) As Planning is nothing but thinking before the action takes place. Explain the essential characteristics of planning. \[10\]

Q.4 What is formal organization? Explain the various organizational structures that can be used in an organization. \[20\]

Q.5 a) What do you mean by manpower planning? What are the prerequisites to design manpower planning? \[10\]
   b) Explain in brief the various methods adopted for training the employees in an organization. \[10\]

Q.6 As control is a continuous process what are the factors that affect the process of controlling? Explain in detail. \[20\]

Q.7 Why strategies are important for an organization? Explain the components and elements of the strategic management model. \[20\]
Q.1  a) Which bus slot provides the highest video performance?
   i) PCI  ii) SCSI  iii) AGP  iv) PCIe
b) Moving your CPU’s speed beyond its normal operating range is called:
   i) Overclocking  ii) Overdriving  iii) Overpowering  iv) Overspeeding
c) The printer connects to you computer with a:
   i) DB25 parallel port  ii) 21 pin serial port  iii) USB port  iv) MIDI port
d) On which type of computer RAM is considered the most important?
   i) Gaming  ii) Virtualization workstation  iii) AV workstation  iv) HTPC
e) Which port is typically known as a serial port?
   i) DVI  ii) COMI  iii) LPTI  iv) SCSI
f) Routers functions at _________ layer.
   i) Physical  ii) Data link  iii) Network  iv) Transport
g) A tree topology is a variation of a ________ topology:
   i) Mesh  ii) Star  iii) Bus  iv) Ring
h) DNS is the abbreviation of:
   i) Dynamic name system  ii) Dynamic network system
   iii) Domain name system  iv) Domain network service
i) How many layers are there in TCP/IP model?
   i) 4  ii) 5  iii) 6  iv) 7
j) What is the use of bridge in network?
   i) To connect LANs  ii) To separate LANs  iii) To control network speed  iv) All of these

Q.2  a) Explain the various components of motherboard in terms of ports, slots, add on cards and power supply units.  10
b) Explain the disk management technique. What could be minimum and maximum size restriction of a disk and how many disks partition can be created in a system.  10

Q.3  a) Discuss various input and pointing devices with appropriate figures.  10
b) Explain the following:
   i) Printers and plotters.
   ii) Impact and non-impact printers.
Q.4  
   a) What are network pointers? Write down its features.  
   b) Differentiate between:  
      i) RISC and CISC processor architectures.  
      ii) Desktop processors and mobile processors.  

PART-B

Q.5  
   a) Explain the responsibilities of data link layer and presentation layer.  
   b) Explain and differentiate bus, star and mesh topologies.  

Q.6  
   a) Discuss in detail IEEE 802 standards regarding various network technologies.  
   b) What are the role of hubs, bridges and routers in a network. Explain briefly.  

Q.7  
   a) What are firewalls? Why it is important. Also, explain the steps to configure it.  
   b) How cross site scripting cases vulnerability in the web applications and what could be possible resolutions for it.
Q.1  **Multiple choice questions (Attempt any ten):**

a) The method by which objects of one class get the properties of objects of another class is known as:
   i) Inheritance  
   ii) Encapsulation  
   iii) Attraction  
   iv) None of the above

b) The concept of declaring same function name with multiple definition is:
   i) Function overloading  
   ii) Operator overloading  
   iii) Both i) and ii)  
   iv) None of the above

c) The members of a class are by default:
   i) Public  
   ii) Private  
   iii) protected  
   iv) None of the above

d) A, B and C are objects of same class. To execute the statement C=A+B, the operator must be overloaded.
   i) +  
   ii) =  
   iii) Both i) and ii)  
   iv) None of the above

e) The ambiguity of members normally occurs in:
   i) Single inheritance  
   ii) Multilevel inheritance  
   iii) Multiple inheritance  
   iv) None the above

f) The array name itself is a:
   i) Pointer  
   ii) Reference  
   iii) Variable  
   iv) Object

g) Static binding is done at the time of:
   i) Compilation of program  
   ii) at run-time  
   iii) Both i) and ii)  
   iv) None of the above

h) When a base class is not used for object declaration it is called as:
   i) Abstract class  
   ii) Container class  
   iii) Concrete class  
   iv) Derived class

i) Templates are suitable for:
   i) any data type  
   ii) basic data type  
   iii) Derived data type  
   iv) All of the above

j) The statement \( a = b \), where \( a \) and \( b \) are objects does the following:
   i) copies data of object \( b \) to object \( a \)  
   ii) Not a valid statement.  
   iii) Calls copy constructor  
   iv) None of the above.

k) Array elements are stored in:
   i) Continuous memory location.  
   ii) Different memory location.  
   iii) CPU registers  
   iv) None of the above.

**PART A**

Q.2  a) What is object-oriented programming? Explain the key concepts of OOP.
b) Explain the following terms:
   i) Conditional statement.
   ii) Data encapsulation.
   iii) Static binding.
   iv) Reference variable.

Q.3 a) What are inline functions? Discuss their advantages and disadvantages. 10
b) What are default arguments? Where are default arguments assigned? 10

Q.4 a) Explain the concept of array of objects with the help of an example. 10
b) How the objects are passed as function arguments? Explain the three methods to pass an object as an argument to a function with suitable examples. 10

PART-B

Q.5 a) Explain copy constructor with the help of an example. 10
b) What do you mean by overloading of constructors? How does it benefit the programme? 10

Q.6 a) What is the difference between multilevel and hybrid inheritance? Explain with the help of an example. 10
b) How are constructors and destructors executed in multilevel inheritance? 10

Q.7 a) Explain the mechanism of exception handling. 10
b) How can templates be used for generic programming? Give suitable examples in support of your answer. 10
Q.1 Discuss the following questions in brief:
   a) Operating system.
   b) Multiprogramming.
   c) Thread.
   d) Thrashing.
   e) Critical section.
   f) Resources of computer system.
   g) Compaction.
   h) Resource allocation graph.
   i) Hashing.
   j) Distributed operating system.
   k) Interprocess communication.
   l) Safe sequence in deadlock.

Q.2 Assume you have the following jobs to execute with one processor, with the jobs
   arriving in the order:

<table>
<thead>
<tr>
<th>Process</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burst time</td>
<td>70</td>
<td>10</td>
<td>20</td>
<td>12</td>
<td>60</td>
</tr>
</tbody>
</table>

   Use FCFS and RR (Quantum = 30) scheduling and calculate waiting time and
   turnaround time for each process.

Q.3 a) What is the need of process synchronization? Discuss the process synchronization
   mechanism for two process solution.
   b) State producer—consumer problem.

Q.4 a) How a time sharing system differs from:
   i) Batch processing system.
   ii) Multi-programming system.
   iii) Real – time system.
   b) List and discuss in brief the important functions performed by an operating system.

Q.5 a) Suppose there are 2 copies of resource A, 3 copies of resource B and 3 copies of
   resource C. Further the process P1 holds one unit of resource B and C and is waiting
   for a unit of resource A. The process P2 is holding a unit of A and waiting for a unit
   of B. Process P3 holding one unit of A two units of B and one unit of C. Draw
   resource allocation graph. Is the system in a deadlocked state? Why or why not?
   b) Discuss various methods to prevent a deadlock in detail.

Q.6 What is a page fault? When do page faults occur? Describe the actions taken by
   operating system when page fault occur.
Q.7  
  a) What is the significance of file attributes?  
  b) What are different file access methods?  
  c) Which file operations are applicable to directories? Which are not?  
  d) What is the difference between sequential and random access mechanism?
Q.1 Answer the following briefly:
   a) Define the term DBMS.
   b) Define logical data independance.
   c) Explain any two roles of DBA.
   d) What is relational intersection? Write the syntax in relation algebra for intersection.
   e) Write the syntax and example of update table command.
   f) Differentiate between char and varchar (2) datatype.
   g) Define any two functional dependencies with suitable example.
   h) Write any two codd rules for RDBM.
   i) What are locker? Explain its advantages in concurrent management of kansasctions?
   j) What is the importance of recovery procedures.

PART-A

Q.2 Explain three level architecture of DBMS. Explain the role of mapping in implementation of various data indepence.

Q.3 a) Define relational model.
   b) Explain various components of relational model with suitable example.

Q.4 Explain the following commands with syntax and suitable example:
   a) Create table
   b) Insert
   c) Group by clause
   d) Alter table
   e) Delete table and drop table.

PART-B

Q.5 What is functional dependency? Explain the various normal forms in relation with various dependencies. Discuss the method to remove those dependencies to normalize the database.

Q.6 What is deadlock? Explain different deadlock handling techniques.

Q.7 What are different types of failures? Explain various recovery procedures used to recover from futures in databases.
Q.1 Multiple choice questions:

a) Compiler translates the source code to:
   i) Executable code.
   ii) Machine code.
   iii) Binary code.
   iv) Both ii) and iii)

b) In a compiler, keywords of a language are recognized during:
   i) Parsing of program.
   ii) Code Generation.
   iii) Lexical analysis of program.
   iv) Data flow analysis.

c) A system program that combines separately compiled modules of program into a form suitable for execution is:
   i) Assembler.
   ii) Linker loader.
   iii) Gross compiler.
   iv) None of the mentioned.

d) _________ is the process of finding parse tree for a string of tokens.
   i) Parsing.
   ii) Analyzing.
   iii) Recognizing.
   iv) Tokenizing.

e) A system program that set-up an executable program in main memory ready for execution is:
   i) Assembler.
   ii) Linker.
   iii) Loader.
   iv) Text editor.

f) A computer system that permits multiple users to run programs at same time:
   i) Real time systems.
   ii) Multiprogramming system.
   iii) Time sharing system.
   iv) Multitasking system.

g) In which way a macro-process for assembly language can be implemented?
   i) Independent two-pass assembler.
   ii) Independent one-pass assembler.
   iii) Processor put into pass 1 of a standard two pass assembler.
   iv) All of the mentioned.

h) A grammar that produces more than one parse tree for some sentence is called as:
   i) Ambiguous.
   ii) Unambiguous.
   iii) Regular.
   iv) All of these.

i) What is operating system?
   i) It act as an interface between hardware and application programs.
   ii) It is collection of programs that manage hardware resources.
   iii) It is system service provider to the application programs.
   iv) All of the above.
j) Which is an example of operating system?
   i) MS-Word.   ii) MS-DOS.   iii) MS-Excel.   iv) MS-Access.  

PART-A

Q.2  
a) What is system programming? What are the components of system programming? 10  
b) What is operating system? Differentiate batch operating system, Time-sharing operating system and distributed operating system. 10  

Q.3  
a) What is I/O Redirection? Explain different types of I/O Redirection. 10  
b) What is the need and function of interrupts in operating system? 5  
c) What is file, categorize different attributes of file. 5  

Q.4  
a) Write short notes on:  
   i) Syntax analysis.  
   ii) Intermediate code generation. 5x2  
b) What is code optimization? Explain different types of code optimization with suitable example. 10  

PART-B

Q.5  
a) Explain an algorithm of two pass macroprocessor with suitable example. 5  
b) What is the function of nested macro calls, explain with suitable examples? 15  

Q.6  
a) What is loader? What are the functions of loader? 5  
b) What are binders? What are the functions of binder? 5  
c) What is absolute loader? Explain the function of absolute loader with suitable example. 10  

Q.7  
a) What is the function of editor? Explain different types of editors. 5  
b) Explain the function and algorithm of two-pass assembler with suitable example. 15
Q.1 Answer the following:
   a) Does the vector $(2, -1, 1)$ is in the span of the set $s = \{(1,0,2),(-1,1,1)\}$?
   b) Define ‘consistent system of linear equation’.
   c) Define homogeneous equation.
   d) What is adjoint of a matrix?
   e) Find $|A|$ where $A = \begin{vmatrix} 15 & 9 \\ 12 & 3 \end{vmatrix}$.
   f) Linear transformation is __________.
   g) What is significance level?.
   h) Explain correlation.
   i) State Cayley-Hamilton’ theorem.
   j) Define a ring.

**PART-A**

Q.2 a) Prove that $(z_1, z_2, z_3)$ is not an abelian group.  
   b) Show that the set $S = \{e^x, xe^x, x^2 e^x\}$ in $C^2(-\infty, \infty)$ is linearly independent.

Q.3 a) Find the inverse of the given matrix $A = \begin{bmatrix} 1 & 3 & 3 \\ 1 & 4 & 3 \\ 1 & 3 & 4 \end{bmatrix}$.
   b) For what values of $(\lambda)$ and $(\mu)$ the system of equations:
      $\begin{align*}
      x + y + z &= 6 \\
      x + 2y + 3z &= 10 \\
      x + 2y + \lambda z &= \mu
      \end{align*}$
      has an unique solution.

Q.4 a) Verify Cayley-Hamilton theorem for the given matrix $A$:
   $A = \begin{bmatrix} 1 & 0 & 2 \\ 0 & 2 & 1 \\ 2 & 0 & 3 \end{bmatrix}$
   Find its inverse.
   b) Explain the following:
      i) Diagonal matrix.
      ii) Rank of matrix.

**PART-B**

Q.5 a) The following table shows the marks obtained 100 candidates in an exam. Calculate the mean, median and standard deviation.

<table>
<thead>
<tr>
<th>Marks obtained:</th>
<th>1–10</th>
<th>11–20</th>
<th>21–30</th>
<th>31–40</th>
<th>41–50</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of candidate:</td>
<td>3</td>
<td>16</td>
<td>26</td>
<td>31</td>
<td>16</td>
</tr>
</tbody>
</table>
b) Discuss various laws of ‘probability’.
Q.6 a) Explain the term ‘Level of significance’.
  b) Calculate the covariance and the coefficient of correlation between \( x \) and \( y \) if:
  \[
  n = 10, \sum x = 60, \sum x^2 = 400, \sum y^2 = 580, \sum xy = 305
  \]
Q.7 a) Discuss the steps to formulate the linear programming problems.
  b) Express the following transportation problem as an LPP. Find its initial basic solution by VAM:

<table>
<thead>
<tr>
<th></th>
<th>( D_1 )</th>
<th>( D_2 )</th>
<th>( D_3 )</th>
<th>( D_4 )</th>
<th>Supply ( a_i )</th>
</tr>
</thead>
<tbody>
<tr>
<td>( O_1 )</td>
<td>2</td>
<td>3</td>
<td>11</td>
<td>7</td>
<td>6</td>
</tr>
<tr>
<td>( O_2 )</td>
<td>1</td>
<td>0</td>
<td>6</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>( O_3 )</td>
<td>5</td>
<td>8</td>
<td>15</td>
<td>9</td>
<td>10</td>
</tr>
<tr>
<td>Demand ( b_j )</td>
<td>7</td>
<td>5</td>
<td>3</td>
<td>2</td>
<td>10</td>
</tr>
</tbody>
</table>
Q.1 Answer the following:
   a) Give one example of non-homogeneous equation.
   b) Define 'singular matrix'.
   c) State 'multiplication law' of probability.
   d) State consistency theorem.
   e) Compute the inverse:
      \[
      A = \begin{bmatrix}
      5 & 13 \\
      9 & 27 \\
      \end{bmatrix}
      \]
   f) Differentiate between consistent and inconsistent system of linear equation.
   g) Linear transformation is ___________.
   h) Define 'regression' in statistics.
   i) Define a 'vector space' over the field (F).
   j) Every finite integral domain is a __________.  

PART-A

Q.2 a) Define a group. Prove that \((\mathbb{Z},+\)) is not an abelian group.  
   b) Find the inverse of the given matrix:
      \[
      A = \begin{bmatrix}
      1 & 2 & -1 \\
      3 & 0 & 2 \\
      4 & -2 & 5 \\
      \end{bmatrix}
      \]

Q.3 a) Using consistency theorem, solve the following equation:
   \[
   \begin{align*}
   x + y + z &= 9 \\
   2x + 5y + 7y &= 52 \\
   2x + y - z &= 0
   \end{align*}
   \]
   b) For what values of \((\lambda)\) and \((\mu)\) the system of equations:
   \[
   \begin{align*}
   x + y + z &= 6 \\
   x + 2y + 3z &= 10 \\
   x + 2y + \lambda z &= \mu
   \end{align*}
   \]
   Has an unique solution.  

Q.4 a) Verify Cayley-Hamilton theorem for the matrix:
   \[
   A = \begin{bmatrix}
   8 & -8 & -2 \\
   4 & -3 & -2 \\
   3 & -4 & 1
   \end{bmatrix}
   \]
   b) Find the rank of the matrix:
\[ A = \begin{bmatrix} 1 & 1 & 2 \\ 1 & 2 & 3 \\ 0 & -1 & -1 \end{bmatrix} \]

c) What do you mean by the term ‘diagonalization of a matrix’.

**PART-B**

Q.5  
a) Discuss all the measures of control tendency along with suitable examples.  

b) Calculate the regression equation of (X and Y) and (Y on X) from the following data:

<table>
<thead>
<tr>
<th>x</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>y</td>
<td>2</td>
<td>5</td>
<td>3</td>
<td>8</td>
<td>7</td>
</tr>
</tbody>
</table>

10

Q.6  
a) What do you mean by ‘sampling’? Explain all types of methods for sampling.  

b) Write short notes on following:
   i) Chi-square Test.
   ii) Test of hypothesis.  

5x2

Q.7  
a) Discuss the simplex method. Discuss the steps to formulate the linear programming problems.  

b) Use the Simplex Method to solve the problem:

Maximize : \( u = 2x + 3y \)

Subject to:

\[-2x + 3y \leq 2 \]
\[3x + 2y \leq 5 \]

and \( x, y \geq 0 \)

10
Q.1 Answer the following:
   a) Which of the following is non-linear data structure?
      i) Trees. ii) Stacks.
      iii) Strings. iv) None of these.
   b) The smallest element of an array’s index is called its ____________.
      i) Base. ii) Lower bound.
      iii) Upper bound. iv) None
   c) The data structure required to evaluate a postfix expression is ________.
      i) Stack. ii) Queue.
      iii) Linked list. iv) None.
   d) Time taken for addition of element in queue is __________.
      i) O(1) ii) O(n)
      iii) O(log n) iv) None
   e) A doubly linked list has ________ pointers with each node.
      i) 0 ii) 2
      iii) 1 iv) 3
   f) In a linked list, insertion can be done as __________.
      i) beginning ii) middle
      iii) end iv) All of above
   g) In a binary tree, a sequence of consecutive edges is called __________.
      i) Path ii) Rotate
      iii) Two-way iv) None of these
   h) An adjacency matrix representation of a graph cannot contain information of:
      i) nodes ii) edges
      iii) None of above
   i) The operation of processing each element in the list is known as ________.
   j) Before inserting into stack, one must check the condition of ________.

\[2 \times 10\]

**PART-A**

Q.2 a) What is radix sort? Sort the following data using radix sort and find its complexity:
   389, 165, 789, 438, 990, 351, 286.
   \[10\]
   b) Discuss the following:
      i) Top down approach.
      ii) Sparse matrices.
   \[10\]

Q.3 What is stack? Discuss various operation of stack. Also, explain any two applications of stack with example.
   \[5 \times 4\]

Q.4 a) What is difference between linked list and array?
   \[5\]
   b) Write an algorithm to insert and delete an element from linked list.
   \[10\]
c) What is the use of polynomial representation in linked list? Discuss with suitable example.

**PART-B**

Q.5 Write short notes on the following:
   a) Threads.
   b) Binary search tree.

Q.6 a) What is minimum spanning tree? Write Kruskal’s algorithm for minimum spanning tree.
   b) Explain BFS and DFS method.

Q.7 a) What is difference between fixed and variable length record?
   b) Discuss various collision resolution techniques. Give example of each.
End Semester Examination, Dec. 2018
MCA — Third Semester
DATA STRUCTURES (MCA-303A-CB)

Time: 3 hrs.  Max Marks: 100
No. of pages: 2

Note: Attempt FIVE questions in all; Q.1 is compulsory. Attempt any TWO questions from PART-A and TWO questions from PART-B. Marks are indicated against each question.

Q.1 a) Fill in the blanks:
   i) Linked List overcome the limitations of __________.
   ii) Tree traversals methods are __________.
   iii) _________ tree can be used as an index.
   iv) _________ data structure can be used to perform recursion.
   v) Methods to find Minimum Spanning Tree are__________, __________.
   vi) Complexity can be measured in terms of__________, __________. 1×6

b) Short answer type questions:
   i) What are the techniques of graph traversing?
   ii) What do you mean by threaded tree?
   iii) What is the meaning of sorting?
   iv) What is overflow and underflow condition in a linked list?
   v) Describe the structure of node in doubly linked list.
   vi) Differentiate Linear and Binary Search. Which is better and why?
   vii) What is dequeue? 2×7

PART-A

Q.2 a) Write algorithm for insertion in doubly linked list at Beg, Mid, end. And also explain it diagrammatically 12
   b) An array A [5][5] is stored in the memory with elements occupying 4 bytes of space. Assuming the base address of A to be 1000, compute the address of A [2][4] when the array is stored row wise and column wise. 8

Q.3 a) Sort the given list using Heap sort
   23, 34, 45, 12, 17, 18, 45, 56, 32, 42 15
   b) Write algorithm to find largest and second largest element from an array 5

Q.4 a) Convert the expression into its postfix form and also evaluate it. Write the algorithm for conversion of infix into postfix 5\(^{\ast}(6+2)-12/4\) 12
   b) Write algorithm for insertion and deletion in circular queue 8

PART-B

Q.5 a) Construct a tree with given data:
   Inorder D, B, F, E, A, G, C, L, J, H, K
   b) How threading is helpful to improve the memory utilization? 8

Q.6 a) Differentiate between the following:
   i) Trees and Graphs.
   ii) B and B+ Tree. 4×2
   b) What do you mean by hashing? What are various methods for collision resolution? 12
Q.7 Traverse the given graph using graph traversal methods DFS and BFS with A as source and J as destination vertex and also write algorithm for the same.
Q.1 Multiple choice questions:

a) The graphics can be:
   i) Drawing  ii) Photograph, movies
   iii) Simulation iv) All of these

b) Graphics is one of the ________ major key element in design of multimedia application:
   i) Five  ii) Three
   iii) Four  iv) Eight

c) Types of computer graphics are:
   i) Vector and raster ii) Scalar and raster.
   iii) Vector and scalar iv) None of these.

d) GKS stands for:
   iii) None of the above. iv)

e) The major components of CRT are:
   i) Electronic Gun ii) Focusing electrode
   iii) Control electrode iv) All of the above

f) The CAD stands for:
   i) Computer aided drawing ii) Computer aided design
   iii) Commonly available data iv) Computer and data

g) Pixel stands for:
   i) Picture element ii) File format
   iii) Sound iv) None of these

h) The screen images is maintained by repeating scanning the same image. The process is known as:
   i) Refreshing of screen ii) Redisplay
   iii) Redrawing iv) Both iii) and iv)

i) __________ is used to regulate the flow of electrons in CRT?
   i) Electronic gun ii) Focusing electrode
   iii) Control electrode iv) All of the above.

j) Interactive computer graphics enables a user to customize the graphics in ________.
   i) Computer way ii) His own way
   iii) Both i) and ii) iv) None of these

Write short notes on the following:

k) Boundary fill algorithm.

l) Wireframe model.
**PART-A**

Q.2  a) What do you understand by the term computer graphics? Explain the various application of computer graphics.  
     b) What is cathode Ray Tube? Explain its working.

Q.3  a) Explain the various interactive graphical techniques with examples.  
     b) Plot a line from (6,3) to (20, 10) by digital differential algorithm.

Q.4  What is a spline? What are the major differences between Bezier curve and B-spline curve?

**PART-B**

Q.5  a) A unit square is scaled by a factor 2 units along one of its diagonals. Find transformation matrix required to achieve this transformation.  
     b) Compare parallel and perspective projection with reference to real life.

Q.6  a) Explain Cohen Sutherland algorithm for line segment clipping.  
     b) Explain the importance of normalized co-ordinate system in viewing transformation. Also, explain window to viewport mapping.

Q.7  Write short notes on:  
     a) Hidden surface removal.  
     b) Z-buffer algorithm.
End Semester Examination, Dec 2018
MCA — Third Semester
COMPUTER SYSTEM ARCHITECTURE (MCA-305CB)

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

Note: Attempt **FIVE** questions in all; **Q.1 is compulsory.** Attempt any **TWO** questions from **PART-A** and **TWO** questions from **PART-B.** Marks are indicated against each question.

Q.1 Write short notes on the following:
   a) Von Neumann model.
   b) Multiplexer expansion.
   c) Stack organization.
   d) Pipeline processors.  

**PART-A**

Q.2 a) What are logic gates? Explain basic gates with their logic diagram and truth table. 10
   b) Perform the following:
      i) \((101010000)_2 - (1110000)_2\) using 2’s complement arithmetic. 5×2

Q.3 a) Differentiate between sequential and combinational circuit. Draw and explain the working of 4 bit binary counter. 10
   b) What are the various characteristics of combinational circuit? Draw a 4×16 decoder. 10

Q.4 What are the various types of instructions? Explain the various types of instruction format used in the computer. 20

**PART-B**

Q.5 What are the various modes of transfer? Explain DMA transfer. 20

Q.6 What is virtual memory? Explain mapping in virtual memory. 20

Q.7 Write short notes on the following:
   a) Instruction pipeline.
   b) Reservation table.
   c) Interleaved memory organization.
   d) Pipeline hazards. 5×4
Q.1 Multiple choice questions (Only one option is correct):

a) JavaScript is an ___________ language.
   i) compiled  ii) interpreted

b) We cannot place JS Code in the body tag. Say true/false.
   i) True  ii) False

c) Which of the following variables is not a predefined variable?
   i) $get  ii) $ask
   iii) $request  iv) $post


d) All variables in PHP start with which symbol?
   i) !  ii) $
   iii) &  iv) None of these

e) How do you write “Hello World” in PHP
   i) echo “Hello World”;
   ii) “Hello World”;
   iii) Response. Write(“Hello World”);
   iv) printf(“Hello World”)

f) PHP’s numerically indexed array begin with position ___________
   i) 1  ii) 2
   iii) 0  iv) –1

g) Which function is used to erase all session variables stored in the current session?
   i) session_destroy()  ii) session_change()
   iii) session_remove()  iv) session_unset()

h) Which one of the following should not be used while sending passwords or other sensitive information?
   i) GET  ii) POST
   iii) REQUEST  iv) NEXT

i) Which of the following method sends input to a script via a URL?
   i) Get  ii) Post
   iii) Both  iv) None of these

j) Which one of the following method is used to retrieve the number of rows affected by an INSERT, UPDATE, or DELETE query?
   i) num_rows()  ii) affected_rows()
   iii) changed_rows()  iv) new_rows()  $\times 10$

PART-A

Q.2 Write short notes on the following:

a) Inline CSS.

b) IMG Tag.

c) Link Tag.

d) Table Tag.

e) BR Tag.  $4 \times 5$

Q.3 What is web application? Differentiate between client side scripting and server side scripting.  $20$
Q.4  a) What is the use of final keyword?  
     b) What the function name in PHP to delete an element from an array?  

**PART-B**

Q.5  What is session object in PHP? How session is created and destroyed? Explain the mechanism to store and use values in a session.  

Q.6  Explain the following term in reference with PHP: 
     a) Abstraction.  
     b) Encapsulation.  
     c) Inheritance.  

Q.7  Write a program to check the user credentials, whether they are correct are not. If the credentials are correct then the user will be redirected to another page.
Q.1 Answer the following questions:
   a) Describe the meaning of portability.
   b) Show how to use the relative pathname.
   c) Can the super user delete a file or directory of a user, no matter how the
       permissions are set by user? Justify your answer.
   d) How can you move from text mode to the command mode while working in VI editor?
   e) How will you compress a file a.txt to a.txt.gz?
   f) What is the following command expected to do Kill-9-10115?
   g) Discuss the concept of command line parameter.
   h) List the different types of files being supported by UNIX.
   i) Draw a process control block.
   j) Define ways to create named pipes.

Q.2
   a) “Operating systems like UNIX provide services for both programs and users”. Justify
       this statement with suitable examples.  
       10
   b) Define “Operating system”. Explain how UNIX fulfills more than that role. Discuss
       with suitable examples.  
       10

Q.3 How will you perform the following task?
   a) How to remove duplicate lines from a file using sort?
   b) How to count number of ordinary files in home directory tree?
   c) Select and print lines 5 to 10 of a file.
   d) How will you perform search in a file? Discuss various parameters used in
       searching.  
       5×4

Q.4
   a) Discuss the Inode and UNIX file system.  
       10
   b) Differentiate hard links and symbolic links. Give suitable examples to support your
       answer.  
       10

Q.5 Write a shell script which gets executed the moment that user logs in. It should display
   the message “good morning/ good afternoon/ good evening” depending upon the time
   at which user logs in.  
   20

Q.6
   a) The following code is not displaying today’s date, correct the code echo “Today’s
       date is date”.
   b) Find out the error in the following code for displaying the names of all the files that
       begin with the character a and for which we have read permission:
       
       ```
       for f in a *
       do
         if test –d $f –a test ! –r $f
       then
         echo $f
       ```
The following code is not displaying words of the file a.txt. Find the error:

```bash
for K in cat a.txt
do
echo $k
done
```

c) The following code is not displaying words of the file a.txt. Find the error:

d) The following code is not displaying the count of the number of command line arguments passed. Correct the code:

```bash
echo –n "the number of parameters are $ *"
```

Q.7  

a) How will you define socket? Explain its role in the remote applications.  
b) Discuss the working of a socket with the help of suitable diagram.
Q.1 Choose the correct option:

a) Interactive multimedia becomes hypermedia when:
   i) The information is available on the Web—either the internet or a local area network.
   ii) Quizzes and tests with evaluations and scoring are included.
   iii) It includes a structure of linked elements through which a user can navigate and interact.
   iv) The user can change such attributes as volume and type size.
   v) The content formatting complies with the American Standard Code for Information Interchange.

b) Which of the following is a typical method for word searching in a hypermedia system?
   i) Best fit.
   ii) Adjacency.
   iii) Popularity.
   iv) Tracking.
   v) Localization.

c) The 3-D process of extending a plane surface some distance, either perpendicular to the shape’s outline or along a defined path, is called:
   i) Lathing
   ii) rendering
   iii) modeling
   iv) extruding
   v) Skinning

d) Graphic artists designing for print media use vector-drawn objects because:
   i) They can contain more subtle variations in shading than bitmap graphics.
   ii) Printing inks respond better to them.
   iii) They can be converted across platforms more easily.
   iv) They can be scaled to print at any size.
   v) They can be viewed directly in a web browser.

e) Each individual measurement of a sound that is stored as digital information is called a:
   i) Buffer
   ii) Stream
   iii) Sample
   iv) Capture
   v) Byte.

f) To create a smooth transition between two images when morphing, it’s important to set numerous:
   i) Layers
   ii) Keyframes
   iii) Keypoints
   iv) Anchor tags
   v) Splines.

g) A video signal transmitted with all the signals mixed together and carried on a single cable is called:
   i) RBG video
   ii) Composite video
   iii) Component video
   iv) Multiformat video
   v) Chroma-key video.

h) A barcode reader can:
   i) Scan graphics into a computer
   ii) Read universal product code patterns
   iii) Provide pressure-sensitive input
   iv) Recognize spoken words when trained
   v) All the above.

i) Multimedia writers are typically involved in writing all of the following except:
   i) Proposals
   ii) Script narrations
   iii) Authoring-language scripts
   iv) Text screens to deliver messages.

j) An IP address can be exchanged with a(n):
Q.2  
(a) Explain the different evolving technologies for multimedia systems.  
(b) Elaborate on two software and two hardware devices specifically related to multimedia.

Q.3  
(a) List and describe the three different types of authoring systems and discuss the advantage of each one.  
(b) How can multimedia skills be enhanced? What are the stages of Multimedia project? Elaborate.

Q.4  
(a) How do you can re-size the image in Photoshop?  
(b) What is resizing images and what are the parameters to change the size of the picture?  
(c) What is healing tool?  
(d) What are lasso tools and name them?

Q.5  
(a) Can flash .swf Movies be very time consuming to edit?  
(b) Can some organizations block flash movies from being received through the internet?  
(c) What is flash twinning?  
(d) How can you publish and export your macromedia flash movies?

Q.6  
(a) How can you add vertices in edit mode?  
(b) What kind of things can you do with blender?  
(c) How do you connect two vertex with an edge?  
(d) What is the 3d view used for?  
(e) How do you duplicate selected 3rd objects?  
(f) What are Nurbs?  
(g) The bone type envelop can be used to__________?  
(h) How do you rotate the viewport?  
(i) How do you attach an armature to a mesh?  
(j) What are shape keys used for?

Q.7  
(a) Why is organizing multimedia database important?  
(b) How can we securing multimedia data?  
(c) What are digital rights management system? How are they helpful?  
(d) How can security attacks be avoided in multimedia database systems?
End Semester Examination, Dec. 2018
MCA – Third Semester
OBJECT ORIENTED PROGRAMMING IN JAVA (MCA-402A (CB))

Time: 3 hrs.  Max Marks: 100
No. of pages: 1

Note: Attempt FIVE questions in all; Q.1 is compulsory. Attempt any TWO questions from PART-A and TWO questions from PART-B. Marks are indicated against each question.

Q.1  
   a) What does AWT stands for?  
      i) All window tools ii) Abstract window tool kit.  
      iii) None of these iv) None of these  
   b) Which is a valid keyword in Java?  
      i) Interface ii) String  
      iii) Float iv) None of these  
   c) Which keyword is used to manually throw an exception?  
      i) Try ii) Finally  
      iii) Throw iv) Catch  
   d) Which of these access specifier can be used for a class so that it’s members can be accessed by a different class in different package?  
      i) Public ii) Protected  
      iii) Private iv) None of these  
   e) Which will contain the body of the thread?  
      i) run( ) ii) start( )  
      iii) stop( ) iv) None of these  
   f) Decrement operator decreases value of variable by what number?  
      i) 1 ii) 2  
      iii) 3 iv) 4  
   g) Constructor can be overloaded. (True/False)  
   h) Void is the return type of a method that does not return any value. (True/False)  
   i) JDK is used to compile, debug and execute java program. (True/False)  
   j) GUI means __________.  

   2×10

PART-A

Q.2  
   a) Give five differences between Java and C++.  
   b) Write a program in Java to find sum and reverse of n digit number.  
   c) List the eight basic data types used in Java. Give examples.  

Q.3  
   a) What is class? What is a constructor? How do we invoke a constructor?  
   b) Compare and contrast overloading and overriding.  

Q.4  
   What is an interface? What is major difference between an interface and a class? Give an example where interface can be used to support multiple inheritances.  

PART-B

Q.5  
   What is an exception? List some of the most common types of exceptions that might occur in Java. What is a finally block? When and how is it used?  

Q.6  
   a) What is the difference between local and remote applet?  
   b) What is the difference between applets and application programs?  
   c) Discuss different stages in the life cycle of an applet.  

20
Q.7 Write a short note on AWT.
Q.1  **Multiple choice questions:**

a) Which provides runtime environment for Java byte code to be executed?
   i) JDK  ii) JVM  iii) JRE  iv) NONE

b) Which operator is used to allocate memory to array variable?
   i) MALLOC  ii) NEW  iii) CALLOC  iv) NONE

c) Which keyword is used to manually throw an exception?
   i) TRY  ii) FINALLY  iii) THROW  iv) CATCH  v) NONE

d) What is name of method used to start a thread execution?
   i) INIT()  ii) START()  iii) RUN()  iv) NONE

e) Which of these keywords is used by a class to use a interface defined previously?
   i) IMPORT  ii) IMPLEMENTS  iii) NONE

State whether the following statements are TRUE / FALSE:

f) We can declare abstract static method.

g) Garbage collection is manual process.

h) A method declaration must always contain access level.

i) Modules operator (%) can be used only with variables of integer type.

j) In Java, AWT classes are contained in Java awt package.

PART-A

Q.2  a) What is WWW? What is the contribution of Java to WWW?  
    b) Describe how various Java tools are used in application development.  
    c) List at least five major differences between Java, C and C++.  

Q.3  a) Write Java assignment statements to evaluate the following equations:

   i) distance = $ut + \frac{at^2}{2}$
   ii) $y = a^3 - b^3 - 3ab(a - b)$
   iii) area = $\sqrt{s(s - a)(s - b)(s - c)}$
   iv) $T = \frac{2m_1m_2}{m_1 + m_2} \times g$
   v) $S = \frac{1}{2} at^2$

    b) Compare in terms of their functions, the following pair of statement:
    i) Switch and if statement.
    ii) Do while and while.

Q.4  What is an interface? What is major difference between interface and class? Describe how interfaces are defined and implemented in Java. Give suitable example.
Q.5  What is a package? What are the benefits of using package in Java? Explain how packages are created and accessed in Java. Give suitable example.  

Q.6  a) What is thread? Discuss life cycle of a thread with suitable diagrams.  
b) How do we define try and catch block? Explain in detail.  

Q.7  a) Differentiate the following:  
   i) Applets and application program.  
   ii) Compile time error and run time error.  
b) Write a short note on 'JDBC'.  
Q.1 Fill the correct answer:
   a) The development is supposed to proceed linearly through the phase in ______ model.
   b) Concept of software engineering are applicable to ________________.
   c) SRS stands for ____________________.
   d) Token count method was developed by ________________.
   e) Formula for calculating the estimation of software development efforts in COCOMO is ____________.
   f) Most desirable form of cohesion is ____________________.
   g) The hardware in which instructions are related through flow of control is ____________.
   h) For an variables, Robust testing yields ____________ test cases.
   i) Cyclomatic complexity is denoted by ________________.
   j) CMM stands for ____________________.

PART-A

Q.2 a) What is software engineering? It is an act, craft or science? Discuss. 10
   b) Discuss the prototype model? What is the effect of designing a prototype on the overall cost of the software project? 10

Q.3 For a program with number of unique operators is 24, number of unique operands is 18, total occurrences of operator is 84, total occurrences of operands is 55, compute the following:
   i) Length of program       ii) Vocabulary of program
   iii) Program volume        iv) Program efforts
   v) Program level            vi) Difficulty. 20

Q.4 a) Explain design strategies. Also, specify the principles of good design. 10
   b) What is modularity? List the important properties of a modular system. 10

PART-B

Q.5 A program reads three number a, b, c within the [1, 50] and print the largest number. Design the test cases for this program using boundary value analysis and robust testing. 20

Q.6 What should we test? Comment on this statement. Illustrate the importance of testing with respect to software development process. 20

Q.7 Explain the following:
   a) Load test.
   b) Stress test.
   c) Alpha test.
   d) Beta test. 5x4
Q.1 Short answer/multiple choice questions TRUE or FALSE:
a) ______________ is an environment in which the search takes place.
d) Machine learning is:
   i) The autonomous acquisition of knowledge through the use of computer
      programs.
   ii) The autonomous acquisition of knowledge through the use of manual programs.
   iii) The selective acquisition of knowledge through the use of computer programs.
   iv) The selective acquisition of knowledge through the use of manual programs.
c) The room temperature is hot. Here the temp hot (use of linguistic variable) can be
   represented by _________________.
   i) Fuzzy set
   ii) Crisp set
d) Where does the Bayes rule can be used?
   i) Solving queries
   ii) Increasing complexity
   iii) Decreasing complexity
   iv) Answering probabilistic query.
e) A heuristic function improve the efficiency of search process. (True/False)
f) In Baye’s theorem, what is meant by P(H₁/E)?
   i) The probability that hypothesis H₁ is true given evidence E
   ii) The probability that hypothesis H₁ is false given evidence E
   iii) The probability that hypothesis H₁ is true given false evidence E
   iv) The probability that hypothesis H₁ is false given false evidence E
g) Non-monotonic logic is basically an extension of _________________.
h) The area of A₁ that investigates methods of facilitating communication between
   people and computers is _________________.
   i) ___________ and __________ are the programming languages of A₁.
j) Research scientists all over the world are taking steps towards building computers
   with circuit patterned after the complex inter connections existing among the human
   brain’s never cells. What name is given to such type of computers? 2x10

PART-A

Q.2 Define holistic search technique. Explain best-first search algorithm with an example.
   How heuristic search technique is better than any other search technique? 20

Q.3 a) “An AI system must contain a lot of knowledge, if it is to handle anything”. Justify
   the given statement with the concept of knowledge pyramid. 10
b) List and discuss two potentially positive and negative effects (each) on society of
   the development of AI techniques. 10
Q.4  a) Represent the following sentences in the form of predicate logic:
   i) All women who like ice-creams like chocolates.
   ii) Some people like eating outside all the time and some people like eating at home all the times.
   iii) Father of John loves the mother of Marry.
   iv) A drinker is enemy of himself.
   v) The best movie in Hollywood is always better than the best movie in Bollywood.

b) Express the following knowledge as a semantic network with nodes and labeled arcs
   “Sam is a Vice President in ABC Corporation. He is married to Katy and has a male child named Joe. Joe goes to school. Sam plays golf and owns a silver coloured German made car Mercedes Benz”

c) Given two clauses – loves (father (a), a) and loves (x, x), what must be generated as a result of resolving these two clauses?

PART-B

Q.5  a) Minimax is a kind of backtracking algorithm that is used in decision making and game theory to find the optimal move of a player. Justify the statement while performing minimax on the following tree:

b) How uncertainty is captured using probabilistic reasoning?

c) State the Baye’s theorem. How is it useful for decision making?

Q.6  a) Draw the architecture of an expert system. What are the characteristics of an ES?

b) Draw the parsing tree for the following:
   “Shyam slept on the platform”

Q.7  Write short notes on:
   a) Fuzzy set.
   b) Neural network with diagram.
   c) Perceptrons.
Q.1 a) Multiple choice questions. Please write suitable explanation for your answer:

i) Viruses are a network ___________ issue.
   a) Performance
   b) Reliability
   c) Security
   d) All of the above.

ii) In PCM, an analog to __________ conversion occurs.
    a) Analog
    b) Digital
    c) QAM
    d) Differential

iii) In __________ transmission, bits are transmitted over a single wire, one at a time.
     a) Asynchronous serial
     b) Synchronous serial
     c) Parallel
     d) a) and b) both

iv) In fiber optics, the signal source is __________ waves:
    a) light
    b) Radio
    c) Infrared
    d) Very low frequency.

v) Guard bands increase the bandwidth for __________.
   i) FDM
   ii) Synchronous TDM
   iii) Asynchronous TDM
   iv) All the above.

b) Fill in the blanks:

i) The __________ layer changes bits into electromagnetic signals.

ii) A __________ connection provides a dedicated link between two devices.

iii) At the CRC generator, __________ are added to the data unit before the division process.

iii) HDLC an Acronym for __________

iv) The PSTN is an example of a __________ network.

2x10

PART-A

Q.2 a) What do you understand by data communication? Explain various components of data communication architecture.

b) Differentiate between LAN, WAN and MAN on the basis of configuration, data rate, transmission media, topologies, o. of uses etc.
Q.3  
a) Explain the process of analog to digital conversion using suitable diagram. State AN and PCM with a relevant example. 
b) Using the bit pattern 0011010110010, draw NRZ (L), NRZ (I), RZ and Manchester encoding patterns.

Q.4  
a) What are the various layers of OSI model. Explain the functions of network layer and transport layer. 
b) Differentiate between TCP/IP and OSI model by focusing on multi dimensional aspect of both the models.

PART-B

Q.5  What do you understand by flow control. Explain all the possible data exchange methods of stop and wait ARQ including lost frame, lost acknowledgement delayed acknowledgement, delayed frame etc.

Q.6  
a) Calculate the VRC and CRC for the following bit pattern using even parity:
   0011101   1100111   1111111   0000000

b) Given the reminder of 111, a data unit of 10110011 and a divisor of 1001, is there an error in the data unit.

c) How can the parity bit detect a damaged data unit?

Q.7  Write short note on:
   a) Token ring
   b) CSMA/CD
   c) TCP
   d) UDP
Q.1  

a) **Answer the following questions:**  
   i) Discuss the layers of PaaS architecture.  
   ii) What are hybrid clouds? Discuss.  
   iii) What is grid computing?  
   iv) Mention platforms which are used for large scale cloud computing.  
   v) What is SaaS?  
   vi) Mention two differences between cloud computing and mobile computing.  

b) **State whether the following statements TRUE or FALSE:**  
   i) Cloud response time does not depend on network speed.  
   ii) To run website on cloud, the web services on cloud should also be running.  
   iii) Even though the cloud server is not available, the cloud application will keep running.  
   iv) For cloud authentication the false acceptance is better than false rejection.  

**PART-A**

Q.2  

a) Define “Cloud”. Explain the various system models for cloud computing.  

b) Explain the architecture of cloud by explaining its various layers.  

Q.3  

a) What is VIM? How is it related to cloud infrastructure management?  

b) How does cloud development is different from traditional software development? Explain in detail.  

Q.4  

What are the basic components of an IaaS based solution for cloud computing? Give some examples of IaaS implementations.  

**PART-B**

Q.5  

What is Aneka container and what is its use? Describe the storage architecture implemented in Aneka.  

Q.6  

Explain the relation between cloud and SOA, how the principles of SOA are implanted in cloud computing?  

Q.7  

a) Differentiate between HOM and FPE.  

b) Write short notes on security management in cloud computing.
Q.1  a) Answer the following questions:
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   iii) What is grid computing?
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**PART-B**

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Q.6  Explain the relation between cloud and SOA, how the principles of SOA are implanted in cloud computing?

Q.7  a) Differentiate between HOM and FPE.

b) Write short notes on security management in cloud computing.
Q.1 a) **Answer the following questions:**
   i) What are the two limitations of CDMA technology?
   ii) Which frequency is used for GSM communication and why?
   iii) Name four wireless technologies.
   iv) What are push messages in mobile?
   v) What are the two applications of RFID?

   b) **Fill in the blanks:**
   i) ISDN stands for ____________________________.
   ii) SMS stands for ____________________________.
   iii) BIS stands for ____________________________.
   iv) BSS stands for ____________________________.
   v) RSS stands for ____________________________.

**PART-A**

Q.2 Explain GSM architecture with diagram and explain the functioning of each component. Also list the advantages and disadvantages of GSM. 20

Q.3 a) Explain the role of physical (PHY) and MAC layer in IEEE 802.11 standard. Explain with the help of architecture. 15
   b) What is scatternet? 5

Q.4 a) Draw the WAP stack architecture and explain the working of each layer. 15
   b) Write a short note on 3G. 5

**PART-B**

Q.5 a) Differentiate between proactive routing protocol and reactive routing protocol. 10
   b) Explain Adhoc on demand distance vector (ADDV) routing protocol with a suitable example. 10

Q.6 Write short notes on the following:
   a) Bluetooth.  
   b) RFID.  
   c) Goals of routing protocols.  
   D) Security issues in Adhoc networks. 5×4

Q.7 a) Explain WIMAX architecture and its applications. 15
   b) Write a short note on tunneling. 5
Q.1 a) Answer the following questions:
   i) What are the two limitations of CDMA technology.
   ii) Which frequency is used for GSM communication and why?
   iii) Name four wireless technologies.
   iv) What are push messages in mobile?
   v) What are the two applications of RFID? 2×5

b) Fill in the blanks:
   i) ISDN stands for ________________________________.
   ii) SMS stands for ________________________________.
   iii) BIS stands for ________________________________.
   iv) BSS stands for ________________________________.
   v) RSS stands for ________________________________. 2×5

PART-A

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End Semester Examination, Dec. 2018
MCA — Fifth Semester
ADVANCE DATABASE SYSTEM (MCA-501 (CB))

Time: 3 hrs.  Max Marks: 100
No. of pages: 1

Note: Attempt **FIVE** questions in all; **Q.1 is compulsory.** Attempt any **TWO** questions from **PART-A** and **TWO** questions from **PART-B**. Marks are indicated against each question.

Q.1 Answer the following questions:
a) Define specialization.
b) Discuss participation constraint.
c) How will you define 4\textsuperscript{th} normal form?
d) Explain composite attribute with example.
e) What is physical data independence? Discuss.
f) Discuss authentication.
g) Discuss like operator in SQL.
h) Discuss two differences between primary key and unique key.
i) Write down the syntax of unique clause.
j) What is transitive dependency? Discuss. 2×10

**PART-A**

Q.2 What is normalization? What are its objectives. Explain first three normal forms with example. 20

Q.3 a) Explain the following with syntax and examples:
   i) Group by. ii) Abs. iii) Substr.
   iv) Ltrim. v) initcap. 3×5
   b) Differentiate between DBMS and RDBMS. 5

Q.4 What is meant by distributed databases? Discuss its advantages and disadvantages, how data can be fragmented through distributed databases? Explain through example. 20

**PART-B**

Q.5 What is concurrency control? Explain various kinds of locks and explain two phase locking protocol with example. 20

Q.6 a) Differentiate between function and procedure. What is the syntax to create store procedure? Explain with suitable example. 10
   b) Explain the various control structure in PL/SQL. 10

Q.7 a) What do you mean by cloud computing? Explain its architecture in detail. 10
   b) What is object oriented database management system, explain with architecture. 10
Q.1  
   a) One of the benefits of data warehousing is ________.
   b) Data warehouse provides ________ data.
   c) Operational systems are meant to provide information to run the day-to-day business. State whether true or false with reason.
   d) Data warehouse is ________, ________, _______ and ______ collection of data.
   e) More detailed data means lower level of granularity. State true or false with reason.
   f) ________ is often used for building, maintaining, managing and using the data warehouse.
   g) The ________ architecture enforces a separation of GUI, business logic and the data.
   h) In ________ schema each dimension table is joined to the fact table using a primary key to a foreign key join.
   i) ________ fact tables are present in fact constellation schema.
   j) ETL stands for ________.

   **PART-A**

   Q.2  
   a) Explain some of the factors which lead to the growth and popularity of data warehouses.  
   b) Explain the following features of a data warehouse:
      i) Subject oriented data ________.
      ii) Integrated data ________.
      iii) Non-volatile data ________.
      iv) Time-variant data ________.

   Q.3  
   a) Explain snowflake schema with the help of an example. Also, mention its advantages and disadvantages.  
   b) Give two important features of fact table and dimension table.

   Q.4  
   a) Why is data mining also known as knowledge discovery?  
   b) “Data warehouse is a prerequisite for data mining”. Justify the statement.

   **PART-B**

   Q.5  
   a) “Strong rules are not necessarily interesting”. Justify the statement with the help of an example.  
   b) Generate frequent itemsets for the following data:

<table>
<thead>
<tr>
<th>TID</th>
<th>items</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Bread, Milk</td>
</tr>
<tr>
<td>2</td>
<td>Bread, diaper, beer, eggs</td>
</tr>
<tr>
<td>3</td>
<td>Milk, diaper, Beer, Coke</td>
</tr>
<tr>
<td>4</td>
<td>Bread, milk, diaper, Beer</td>
</tr>
<tr>
<td>5</td>
<td>Bread, milk, diaper, Coke</td>
</tr>
</tbody>
</table>

   Given that the minimum support =z.

   Q.6  
   a) Differentiate between classification and clustering using suitable example.
b) Explain k-means clustering technique with the help of a suitable example.  

Q.7  
a) Give two real life applications of data mining techniques.  
b) Explain the following terms:  
  i)  Text mining.  
  ii)  Web mining.
Q.1 Choose the correct option:

a) E-business is:
   i) Any electronically mediated communication between an organization and its stakeholders.
   ii) An organization using electronic media to sell direct to its customers.
   iii) An organization using electronic media to purchase from its suppliers.
   iv) The use of electronic communications for all business processes.

b) E-commerce is:
   i) An organization using electronic media to sell direct to its customers.
   ii) An organization using electronic media to purchase from its suppliers.
   iii) Any electronically mediated communication between an organization and its stakeholders.
   iv) The use of electronic communications for all business processes.

c) Match these different aspects of e-commerce:

<table>
<thead>
<tr>
<th>Sell-side e-commerce</th>
<th>i) Electronic transactions with suppliers to an organization.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buy-side e-commerce</td>
<td>ii) Electronic transactions with customers downstream of an organization.</td>
</tr>
</tbody>
</table>

d) Match these different sorts of online media:

<table>
<thead>
<tr>
<th>Paid</th>
<th>Display ads, Google Adwords/PPC, Affiliate marketing.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Owned</td>
<td>Content shared through blogs, media sites and communities.</td>
</tr>
<tr>
<td>Earned</td>
<td>Company blog, company social network site, company own community, company mobile apps.</td>
</tr>
</tbody>
</table>

e) Delivering e-mail based customer support is an example of:
   i) Satisfying customer requirements.
   ii) Anticipating customer requirements.
   iii) Identifying customer requirements.
   iv) None of the above.

f) _________ is an example of business-to-business services offered by Google which gains advertising revenue through hosted videos?
   i) YouTube Brand Channel
   ii) Google Adwords pay per click sponsored link advertising
   iii) Google Search application providing online website services for website owners
   iv) Google Apps Business Application Suite

g) One aim of e-procurement is to increase savings by bulk buying of items:
   i) At the right price.
   ii) Of the right quality.
   iii) Of the right quantity.
   iv) From the right source.

h) A portal which is normally run by a consortium of buyers in order to establish an efficient purchasing environment is a:
   i) Vertical and horizontal e-marketplace.
   ii) Buyer-oriented marketplace.
   iii) Supplier-oriented marketplace.
v) None of the above.
i) Domain registration is:
   i) Ensuring page download speed is acceptable.
   ii) Ensuring the website is running continuously.
   iii) Ensuring e-mail response is acceptable.
   iv) Registering and renewing web address names.

j) An analyst would typically ask, “which types of content do you want to publish on the website?” before asking, “who are the potential audience of the website?” in a preliminary interview with the website owner.
i) True ii) False 2×10

PART-A

Q.2 a) What is the difference between traditional commerce and electronic commerce? Depict three factors that would cause a company to continue doing business in the traditional way, avoiding electronic commerce.  
   b) Describe an e-commerce framework containing the various infrastructure components required for the electronic commerce. 10

Q.3 a) Define web server. How a web client contacts a web server to access a web page? Write all steps that are required including DNS, protocol and Contents of message transmission. b) How a technical manager in an online music selling company will ensure the Vice President that the e-commerce website is performing well? Write down the report required to present before the Vice President. 10

Q.4 a) “Threat to communication channels practically has got impact on both the clients and the servers.” Explain with reference to internet security. b) Write down the various categories of malware and the methods that attackers employ to destroy the components of an e-commerce system. 10

PART-B

Q.5 a) Give the layered architecture of EDI. Explain how the purchase process from a manufacturer to a supplier works, using the layered architecture. Write the detail steps in line with the layered architecture.  
   b) Differentiate between Intranet and extranet with relevance to ecommerce technology. 10

Q.6 a) When did smart cards come into picture in the context of electronic payment systems? Give an account of the various types of smart cards and its requirements from both the consumer’s and merchant’s point of view.  
   b) What are electronic wallets and why are they useful? Explain in about 100 words. 10

Q.7 a) Mention the various Pros and Cons of Online shopping.  
   b) Write short notes on (any two):
   i) Internet marketing techniques.
   ii) Personalized E-Commerce.
   iii) E-Cycle of Internet Marketing. 5×2
End Semester Examination, Dec. 2018
MCA – Fifth Semester
NETWORK SECURITY AND CRYPTOGRAPHY (MCA-504 CB)

Time: 3 Hours Max Marks: 100
No. of pages: 1

Note: Attempt FIVE questions in all. Q.1 is compulsory. Attempt Any TWO questions from PART-A and two questions from PART-B. Each question carries equal marks.

Q.1 Answer briefly the following questions:
   a) What is IP spoofing?
   b) What is buffer overflow?
   c) Write 5 program threats.
   d) What is malicious code?
   e) What are the three D’s of security?
   f) What do you mean by risk analysis?
   g) Differentiate between authentication & authorization.
   h) Give examples of symmetric key ciphers.
   i) Give one example of biometric authentication?
   j) Write the polynomial representation of 10011001.  

   2x10

PART-A

Q.2 a) How is Kerberos designed to provide strong authentication for client / server applications by using recent key cryptography? Also mention the short comings of Kerberos.  
   b) Differentiate between data security and data privacy.  

   15

Q.3 a) What is network security? Explain with suitable examples the various threats of network security. Represent its hierarchy also.  
   b) Differentiate between worm & viruses.  

   15

Q.4 a) Define access control. Give and explain real life examples of any two physical intrusion detection systems.  
   b) Differentiate between plain text and cipher text. Define various encryption techniques.  

   10

PART-B

Q.5 Find the particular & general solution to the following linear. Diophantine equations:
   a) 25x + 10y = 15  
   b) 18x + 30y = 20  

   20

Q.6 What do you understand by digital signatures. Why we need digital signatures. Compare digital signature & conventional signature with respect to following four parameters:-
   i) Inclusion
   ii) Verification
   iii) Relation
   iv) Duplicity  

   20

Q.7 What is public key cryptography? Why there is a need of public & private key in public key cryptography? Explain RSA algorithm by explaining the steps to generate public and private key.  

   20
End Semester Examination, Dec. 2018
MCA — Fifth Semester
BIG DATA ANALYTICS (MCA-506(CB))

Time: 3 hrs. Max Marks: 100
No. of pages: 1

Note: Attempt **FIVE** questions in all; **Q.1 is compulsory.** Attempt any **TWO** questions from **PART-A** and **TWO** questions from **PART-B.** Marks are indicated against each question.

Q.1 Answer the following question:
   a) Name any 4 Data mining techniques.
   b) Where does Big Data come from? List few important sources.
   c) What are the different problems that "Data Mining" can solve in general?
   d) What is structured, semi-structured, unstructured data? Write examples.
   e) Discuss the role of cloud computing in big data.
   f) What are the common input formats in Hadoop?
   g) How to create a table by using HIVEQL?
   h) Define Hadoop Cluster.
   i) What are the key components of HBase?
   j) Give example of one document oriented and one graph oriented database.

   **PART-A**

   Q.2 What are the benefits of Big Data? Discuss various challenges under Big Data. How Big Data Analytics can be useful in the development of smart cities? 20

   Q.3 What is Mongo DB? Explain in brief key features of Mongo DB. Show basic CRUD operations in Mongo DB with proper example? 20

   Q.4 What are the different problems that "Data Mining" can solve in general? Discuss various methods used in preprocessing of data. 20

   **PART-B**

   Q.5 Write Map Reduce steps for counting occurrences of specific numbers in the input text file(s). Also write the commands to compile and run the code. 20

   Q.6 Explain architecture of HDFS with a suitable block diagram. Discuss role of data node and name node in HDFS. Give commands with appropriate arguments to perform data transfer between local file system and HDFS. 20

   Q.7 What are the key differences between Cassandra and Traditional RDBMS? What are the different database elements of Cassandra? List the benefits of using Cassandra. 20
Fill in the blanks:

a) Dynamic programming use ________ optimization.
b) ________ approach is used to get the optimal solution of travelling sales problem.
c) The minimal spanning tree problem determines the ________ total branch lengths connecting all nodes in the network.
d) Hamiltonian path visit each ________ exactly once.
e) ________ is conceptually a top down approach for solving problems.
f) According to strassen’s method the complexity of matrix multiplication is ________.

Short answer type questions:

g) What do you mean by Hamiltonian cycle?
h) Explain the concept of 4-planar graph problem.
i) Define backtracking.
j) How knapsack problem can be solved using greedy method?
k) Explain the concept of travelling Saleman problem.
l) What are various strategies of branch and bound?
m) Differentiate between trees and graphs.

PART-A

Q.2 a) What do you mean by Asymptotic notations? List each notation and explain what it signifies?  
   b) Solve the knapsack problem using greedy method with no of inputs and capacity of bag 15. Profits and weights are given below.  
   \[ n = 7 \ m = 15 \]  
   \[ (p_1, p_2, p_3, p_4, p_5, p_6, p_7) = (10, 5, 15, 7, 6, 18, 3) \]  
   \[ (w_1, w_2, w_3, w_4, w_5, w_6, w_7) = (2, 3, 5, 7, 1, 4, 1) \]  

Q.3 a) Write the algorithm for merge sort method. Analyze its complexity.  
   b) Design the state space tree for merge sort with given list.  
   \[ 23, 34, 12, 16, 17, 19, 2 \]  

Q.4 How can we prove that strassens matrix multiplication is advantageous over ordinary matrix multiplication method?

PART-B

Q.5 a) Why dynamic programming is better than greedy method? How ordered sets can be created in dynamic programming approach? Explain with the help of algorithm.  
   b) Write algorithm for single source shortest path and compute its time complexity.

Q.6 a) Write the algorithm for graph coloring and also explain its concept.  
   b) Differentiate between deterministic and non-deterministic algorithm.
Q.7 How branch and bound is optimal to solve 0/1 knapsack? Generate the state space tree for both LIFO and LC for the following data.

\[ N = 4 \quad M = 15 \]
\[ P_1 = 10 \quad w_1 = 2 \]
\[ P_2 = 10 \quad w_2 = 4 \]
\[ P_3 = 12 \quad w_3 = 6 \]
\[ P_4 = 18 \quad w_4 = 9 \]
Q.1 Multiple choice questions:

a) An object is composed of:
   i) properties.
   ii) methods.
   iii) events.
   iv) Both i) and ii).
   v) All of the above.

b) Which statement about objects is true?
   i) One object is used to create one class.
   ii) One class is used to create one object.
   iii) One object can create many classes.
   iv) One class can create many objects.
   v) There is no relationship between objects and classes.

c) Which property determines whether a control is displayed to the user?
   i) Hide
   ii) Show
   iii) Visible
   iv) Enabled
   v) Cursor


d) Which is not an integer data type?
   i) Single
   ii) Byte
   iii) Short
   iv) Integer
   v) Long


e) The Boolean data type:
   i) is unsigned.
   ii) has two states.
   iii) is displayed by the program as yes or no.
   iv) Both i) and ii).
   v) All of the above.

f) Which is not an ADO.NET DataAdapter Object?
   i) OleDbDataAdapter.
   ii) SQLDataAdapter.
   iii) QueryDataAdapter.
   iv) Both i) and ii)


g) The first step of configuring a DataAdapter is to select:
   i) an adapter object.
   ii) a connection object.
   iii) a database object.
   iv) a dataset object
   v) None of the above.

h) A postback occurs when:
   i) a browser posts a form to the server.
   ii) a user's action activates the handing of a server event.
   iii) a server posts a form to the client.
   iv) Both i) and ii).
   v) All of the above

i) Which is the file extension used for an ASP.NET file?
   i) asn
   ii) asp
   iii) aspn
   iv) aspx


PART-A

Q.2 Write short notes on the following:
   a) Abstract Class.
   b) IL
   c) Garbage collection.

Q.3 What is a delegate? What is it used for? What are the steps involved in creating and using a delegate? Give an example to support your answer.

Q.4 Explain the concept of polymorphism in detail. What are the different types of polymorphism? How is runtime polymorphism implemented in C#? Give suitable example to support your answer.

PART-B

Q.5 Write short notes on the following:
   a) Session.
   b) ViewState.
   c) Page_Load.
   d) Context Menu.

Q.6 Write short notes on the following:
   a) Web Service.
   b) XML.
   c) DataAdapter.

Q.7 Write a program to demonstrate the process of querying a table with disconnected querying method (Use a table of your choice)
End Semester Examination, Dec. 2018
BCA – Second Semester
ENHANCING SOFT SKILLS AND PERSONALITY (MOOC-4458-ESSP)

Time: 2 hrs.  
Max Marks: 50
No. of pages: 1

Note: Attempt FIVE questions in all; Q.1 is compulsory. Attempt any TWO questions from Part-A and TWO questions from Part-B. Marks are indicated against each question.

Q.1 Answer the following:
   a) A holistic approach to personality includes:
      i) Social aspects  ii) Cultural aspects
      iii) Spiritual aspects iv) All of the above.
   b) Non-Verbal communication includes:
      i) Body Language  ii) Facial expression
      iii) Both i) and ii) iv) Neither i) nor ii)
   c) Laziness can be caused by a fixed mind – set (True/False)
   d) Successful people:
      i) Scrutinize time wastage ii) Minimize time wastage
      iii) Both i) and ii) iv) Neither i) nor ii)
   e) According to Abraham Maslow, in any given situation one must choose:
      i) Growth ii) Safety
      iii) Fear iv) None of the above
   f) Soft Skills are independent of time management skill. (True/False)
   g) Values may be:
      i) Inherent ii) Acquired
      iii) Both i) and ii) iv) Neither i) and ii)
   h) Ethics should be determined by:
      i) Circumstances ii) Surrounding
      iii) Both i) and ii) iv) Neither i) and nor ii)
   i) One must listen to higher authorities even at the cost of one’s ethics. (True/False).
   j) Aggressive people:
      i) Force others to serve them ii) Always help others
      iii) Always feel helpless iv) Maintain good relationships. 1x10

PART-A

Q.2 What do you understand by positive attitude? List and explain the traits that helps to form the positive character of a person? 10

Q.3 Explain the importance time management skill with suitable example. Also discuss the relationship between time management and success rate. 10

Q.4 What does it mean to have a mindset? Elaborate various types of mindset in detail. 10

PART-B

Q.5 Describe the relationship between ethics and etiquettis. List down some business etiquette with suitable examples. 10

Q.6 How diet and sleep is important in anybody’s life? Explain the significance of health to improve health. 10
Q.7 What is the role of humour in communication? Explain in detail the role of humour in workplace.
End Semester Examination, Dec. 2018  
BCA – Fourth / Sixth Semester  
EMOTIONAL INTELLIGENCE (MOOC-4462-EI) 

Time: 2 hrs.  
Max Marks: 50  
No. of pages: 2  

Note: Attempt FIVE questions in all; Q.1 is compulsory. Attempt any other FOUR questions. Each question carries equal marks. 

Q.1 Multiple choice short answer questions: 

i) What is emotional intelligence!  
   a) The ability to monitor one’s own and ether’s feelings and one’s thinking and actions.  
   b) The ability to not get angry when provoked.  
   c) Being able to read other people.  
   d) Being persistent and enthusiastic when others are flagging.  

ii) EI is different from other intelligences in that:  
   a) It is a set of skills.  
   b) It can be measured using tests easily.  
   c) The focus is on emotional reasoning, ability and knowledge.  
   d) It is a new type of intelligence.  

iii) One of the key factors of EI is:  
   a) Self-awareness.  
   b) Self-management.  
   c) Social awareness.  
   d) All of the above.  

iv) What would an emotional intelligent manager with positive attitude and good performance, will not achieve:  
   a) Getting more sales.  
   b) Favored by customers.  
   c) Being motivated with work assignments.  
   d) None of these.  

v) Mr. X working in XYZ Ltd has high emotional intelligence. Which of the following exemplifies Mr. X’s behavioral traits?  
   a) Dealing with the anger of a dissatisfied customer.  
   b) Recognizing when a coworker needs help but is too embarrassed to ask.  
   c) Being able to tell whether a customer’s “may be” means “yes” or “No”.  
   d) All of these.  

vi) You are a customer service representative and have just gotten an extremely angry client on the phone. What do you do?  
   a) Hang up. It doesn’t pay to take abuse from anyone.  
   b) Listen to the client and rephrase what you gather he is feeling.  
   c) Explain to the client that he is being unfair that you’re only trying to do your job and you would appreciate if he wouldn’t get in the way of this.  
   d) Tell the client you understand how frustrating this must be for him and offer a specific thing you can do to help him get his problem resolved.  

On the basis of your knowledge about Emotional Intelligence answer the following questions in short. 

vii) Do you believe in gut feeling?  

viii) How do you handle stressful situations?
ix) Does body language matter?  
x) Name two personal habits which have helped you grow in life?  

Q.2 “IQ gets you hired but EQ gets you promoted.” Justify this statement.  

Q.3 Emotional Intelligence is becoming increasingly vital to human’s success in the increasingly digital future of work”. How can EQ affect someone’s progression at work and ability to interact with teams and peers and what impact can it have on physical and mental wellbeing?  

Q.4 It is said that emotional intelligence develops insights into self-regulation and realization of one’s optimum potentials for better performance. Give your views in the favour of the above statement.  

Q.5 Does EQ plays a phenomenal role in managing stress in various phases of life?  

Q.6 a) Write the applications of EQ at family and school.  
    b) What are the correlates of emotional intelligence?
Q.1 a) Define the term knowledge management.
b) What is tacit knowledge?
c) What is knowledge codification?
d) What is data management?
e) Give one application of knowledge management.  

Q.2 What is the need of knowledge management? Explain knowledge management system life cycle with a suitable diagram.  

Q.3 Explain various processes and models used in maintenance of knowledge management lifecycle.  

Q.4 Explain the following terms with a suitable example:
a) Knowledge infrastructure.
b) Knowledge audit.
c) Knowledge team.
d) Knowledge portals.  

Q.5 What are the various steps required to analyze and design a knowledge management system? Also, discuss the prototyping and deployment of knowledge management system.  

Q.6 What are the various legal, ethical and managerial issues involved in managing a knowledge management system?