CENTRAL UNIVERSITY OF HARYANA

End Semester Examinations April 2022

Programme: Master of Computer Applications **Session: 2021-22**

Semester: First **Max. Time: 3 Hours**

Course Title: Computer Organization and Architecture **Max. Marks: 70**

Course Code: SBS CS 01 01 03 C 4004

Instructions:

1. Question no. 1 has seven parts and students need to answer any four. Each part carries three and half Marks.
2. Question no. 2 to 5 have three parts and students need to answer any two parts of each question. Each part carries seven marks.

Q 1. (4X3.5=14)

a) Explain various phases of the instruction cycle.

b) Write the differences between Primary Memory and Secondary Memory.

c) Describe Combinational and Sequential Circuits briefly.

d) What is Boolean Algebra? Discuss the different Laws for the Simplification of Boolean Expressions.

e) What is a K-map? Find the minimum number of NAND gates required to realize AB+AB'C+AB'C'.

f) Write a note on memory hierarchy.

g) What are direct and indirect addressing modes?

Q 2. (2X7=14)

a) Describe Booth's Multiplication algorithm with the help of suitable example.

b) How are floating-point numbers represented on computers? A 36-bit floating-point binary number has eight bits plus sign for the exponent and 26 bits plus sign for the mantissa. The mantissa is a normalized fraction. Numbers in the mantissa and exponent are in signed-magnitude representation. What are the largest and smallest positive quantities that can be represented, excluding zero?

c) Simplify the following Boolean function in sum-of-products form by means of a four-variable K-Map. Draw the logic diagram with (a) AND-OR gates; (b) NAND gates.

$$F(A,B,C,D) = \sum(0,2,8,9,10,11,14,15)$$

Q 3. (2X7=14)

a) Explain the need and function of a Full Adder with a circuit diagram.

b) What is a Flip Flop? Explain the working of SR and D flip-flops with a truth table and logic circuit.

c) Discuss about the Encoders, decoders and counters.

Q 4. (2X7=14)

a) Describe about the page replacement algorithms. Explain two page replacement algorithms with help of suitable examples.

b) Explain direct, associative and set-associative mapping with reference to the cache memory.

c) Describe about Primary Memory and its types in details.

Q 5. (2X7=14)

a) Explain DMA-based Data transfer technique for I/O Devices.

b) Explain the basic organization of a microprogrammed control unit and the generation of control signals using microprogram.

c) Discuss various types of instruction formats with help of suitable examples.

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CENTRAL UNIVERSITY OF HARYANA

End Semester Examinations April 2022

Programme: Master of Computer Applications **Session: 2021-22**

Semester: First **Max. Time: 3 Hours**

Course Title: Computer Network **Max. Marks: 70**

Course Code: SBS CS 01 01 02 C 4004

Instructions:

1. Question no. 1 has seven parts and students need to answer any four. Each part carries three and half Marks.

2. Question no. 2 to 5 have three parts and student need to answer any two parts of each question. Each part carries seven marks.

Q 1. (4X3.5=14)

a) Define Computer Network. What are various application of Computer Networks?

b) Explain FTP and HTTP Protocols.

c) Compare Mesh Topology and Star Topology with diagrams.

d) Discuss about Radio transmission and Microwave transmission and specify their specific application.

e) Explain Data Link Layer. What are the functions of Data Link Layer?

f) What is routing? Explain Flooding algorithm with advantages & disadvantages.

g) Describe about TCP Protocol and UDP Protocol.

Q 2. (2X7=14)

a) Explain OSI Model with diagrams. Compare OSI & TCP/IP Models.

b) What is Multimedia? Briefly Explain Applications of Multimedia.

c) Discuss about DNS and Email.

Q3. (2X7=14)

a) What do you mean by Switching? Compare Circuit Switching, Packet Switching with help of diagram.

b) What do you mean by Transmission medium? Also discuss characteristics of cable medium, Compare Guided & Unguided Transmission medium.

c) What do you understand from Topology? Explain each topology with Advantage and Disadvantage.

Q 4. (2X7=14)

a) Explain Data Link Layer. Discuss Data Link layer protocols and RSVP Protocols with examples

b) Explain ARQ strategies: Also compare Stop-and-Wait, sliding window, Go-Back-N retransmission with examples .

c) What are various Error Detection Techniques? And Explain Checksum and Cyclic Redundancy check (CRC) with examples.

Q 5. (2X7=14)

a) What do you mean by congestion control? Explain any two Congestion control algorithms with help of suitable examples.

b) Explain about Transport Protocol. Define Connection Establishment and Connection Termination mechanisms.

c) Describe about Routing Algorithm and Types of Routing Algorithm. Differentiate between Adaptive and Non-Adaptive Routing Algorithms.

CENTRAL UNIVERSITY OF HARYANA

End Semester Examinations April 2022

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CENTRAL UNIVERSITY OF HARYANA

End Semester Examinations April 2022

Programme: Master of Computer Application **Session: 2021-22**

Semester: First **Max. Time: 3 Hours**

Course Title: Internet Fundamentals **Max. Marks: 70**

Course Code: SBS CS 01 01 02 E 3104

Instructions:

1. Question no. 1 has seven parts and students need to answer any four. Each part carries three and a half Marks.

2. Question no. 2 to 5 have three parts and students need to answer any two parts of each question. Each part carries seven marks.

Q 1. (4X3.5=14)

a) How does client-server model works?

b) Explain anchor tag and image tag with syntax. How is a hyperlink created for a document?

c) What makes a valid e-mail address?

d) Write any four advantages and disadvantages of Internet.

e) Write a short note on (Internet Service Providers) ISPs.

f) Explain the term *Internet Congestion* briefly.

g) What are the various types of networks? Explain briefly.

Q 2. (2X7=14)

a) Explain chat rooms and chatting in detail. How it differs from news group.

b) What is E-mail? Describe different components of an E-mail message with the help of an example.

c) Explain the different operations that can be performed on an E-mail. How MIME is useful in email?

Q 3. (2X7=14)

a) What is Internet Addressing? Given IP Address – 172.16.0.0/25, calculate the number of subnets and the number of hosts per subnet. Also, for the first subnet block, find out the subnet address, first host ID, last host ID and broadcast address.

b) How IPv4 different from IPv6? Explain the structure of an IPv4 and IPv6 header with help of diagram.

c) What do you mean by Internet? How Internet works? What are the various methods of connecting to the internet?

Q 4. (2X7=14)

a) What are various scripting languages? Explain about HTML and XML in brief?

b) Explain working of IIS. Also discuss its features and applications?

c) Write HTML code to draw polygon on a canvas.

Q 5. (2X7=14)

a) Explain the different types of web documents along with their advantages and disadvantages.

b) What is firewall? How does a firewall system works? Also state the limitations of a firewalls.

c) Explain the various types of Public Key Encryption Techniques.

CENTRAL UNIVERSITY OF HARYANA

End Semester Examinations April 2022

Programme: Master of Computer Applications **Session: 2021-22**

Semester: 1st **Max. Time: 3 Hours**

Course Title: Data Structures **Max. Marks: 70**

Course Code: SBS CS 01 01 01 C 4004

Instructions:

1. Question no. 1 has seven parts and students need to answer any four. Each part carries three and half Marks.

2. Question no. 2 to 5 have three parts and student need to answer any two parts of each question. Each part carries seven marks.

Q 1. (4X3.5=14)

a) Differentiate between array and linked list data structures.

b) Describe about Binary Search Tree.

c) What is Graph and its characteristics?

d) How sequential representation of graph can be done?

e) What do you mean by best case, average case and worst case time complexity of an algorithm? Also explain the time complexity of selection sort and quick sort algorithms.

f) Convert following Infix expression to postfix expression using stack in Tabular method
Infix Expression:- **m*n+(p-q)+r**

g) Differentiate between LIFO & FIFO algorithms.

Q 2. (2X7=14)

a) What do you mean by Asymptotic Notation? Explain it with help of suitable examples.

b) What do you understand by data structure? Describe the classification of data structures.

c) What is an array? Describe the representation of array in memory. Write a program using array.

Q3. (2X7=14)

a) What is stack? Describe the array representation of the stack with the help of the suitable functions for operations on it.

b) What is Dequene? What operations are applied on it? Write any two applications of Dequene.

c) Explain about the Implementation of the doubly linked list. What is its advantages & disadvantages?

Q 4. (2X7=14)

a) Construct an AVL tree having the following elements H, I, J, B, A, E, C, F, D, G, K, L Show all the steps.
b) What do you mean by traversal of graph? Illustrate its mechanisms.
c) What is Binary Tree? Describe its types with help of suitable examples.

Q 5. (2X7=14)

a) Explain about selection sort. Also discuss its complexity with help of suitable example.
b) What is Heap Sort? How is it implemented? Explain through suitable example and discuss its complexity.
c) What do you mean by Hash function? Describe various types of Hash Functions and its applications.

CENTRAL UNIVERSITY OF HARYANA

End Semester Examinations April 2022

Programme: Master of Computer Applications | **Session: 2021- 2022**
Semester: First | **Max. Time: 3 Hours**
Course Title: Operating System and Shell Programming | **Max. Marks: 70**
Course Code: SBS CS 01 01 05 C 4004

Instructions:

1. Question no. 1 has seven parts and students need to answer any four. Each part carries three and half Marks.

2. Question no. 2 to 5 have three parts and student need to answer any two parts of each question. Each part carries seven marks.

Q 1. **(4X3.5=14)**

a) What is virtual machines? How it works?

b) What do you mean system calls? Explain the working of system calls.

c) What is Multiprogramming?

d) Define Multitasking and explain with the help of suitable examples.

e) Discuss about the multiprocessing.

f) What is Subprograms? Explain its use.

g) What is the dead lock? Why it occurs?

Q 2. **(2X7=14)**

a) Discuss about the various type of CPU scheduling algorithms. Also explain which algorithm is best.

b) What is role of operating system? Describe about various characteristics and functions of operating system.

c) Discuss the concept of parallel, distributed systems & real-time systems with suitable examples.

Q3. **(2X7=14)**

a) What do you mean by virtual memory? Discuss the concept of logical versus physical address space. Why the concept virtual memory is used?

b) Explain the page replacement. Discuss the LRU algorithm with help of suitable examples.

c) Discuss followings terms in details:

- Segmentation
- Demand paging
- Thrashing

Q 4. **(2X7=14)**

a) Write the various file access methods with their advantages & disadvantages.

b) What is Critical Section also discuss the concept of synchronization.

c) What do you mean by schedulers? Discuss the types of schedulers. Explain one scheduler with the help of suitable examples.

Q 5. **(2X7=14)**

a) Discuss the necessary conditions for dead lock. What are various techniques for dead lock avoidance.

b) What is vi editor? Explain control structures and loops and also write script for control structure and loops.

c) What do you mean by system administration? Explain basic about Linux system administrations.

CENTRAL UNIVERSITY OF HARYANA

End Semester Examinations April 2022

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End Semester Examinations April 2022

Programme: Master of Computer Applications **Session: 2021-22**

Semester: First **Max. Time: 3 Hours**

Course Title: Discrete Mathematical Structures **Max. Marks: 70**

Course Code: SBS CS 01 01 04 C 4004

Instructions:

1. Question no. 1 has seven parts and students need to answer any four. Each part carries three and half Marks.

2. Question no. 2 to 5 have three parts and student need to answer any two parts of each question. Each part carries seven marks.

Q 1. (4X3.5=14)

a) Let us consider U={1,2,3,4,5,6,7,8,9} and
A={1,2,3,4,5}, B={ 4,5,6,7} , C={5,6,7,8,9}, D={1,3,5,7,9}.
Find the following subset of U:
(i) AUB (ii) A` (iii) C-D (iv) (CUD)`

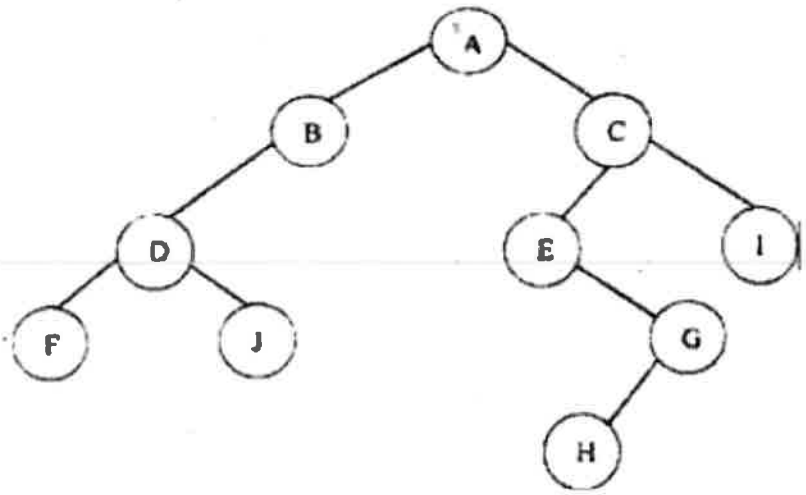
b) Write any four properties of the binary composition operation with example.

c) Define the following graph with suitable example.
(i) Complement graph (ii) subgraph (iii) connected and disconnected graph

d) Seven members of a family have total Rs. 2886 in their pockets. Show that at least one of them must have at least Rs. 416 in his pocket.

e) Construct the truth table for following statements $(p \rightarrow (q \rightarrow r)) \rightarrow ((p \rightarrow q) \rightarrow (p \rightarrow r))$

f) Find the preorder , inorder and postorder traversals of the Binary tree given below



g) Consider an algebraic system (N,+), where the set N={1,2,3,4,5,.....} the set of natural numbers and + is an addition operation. Determine whether (N,+) is a monoid.

Q 2. (2X7=14)

a) Define relation. Explain various properties of the relation with suitable example.

b) What is Hasse diagram? Consider the set A = {4, 5, 6, 7} and R be the relation ≤ on A. Draw the directed graph and the Hasse diagram of Related R.

c) Explain Lattices in detail with suitable example.

Q3. (2X7=14)

a) Define Abelian Group. Consider an algebraic system (G,*), where G is the set of all non-zero real numbers and * is a binary operation defined by

$$a*b=\frac{ab}{4}$$

Show that (G,*) is an abelian group.

b) Prove that $(G,+_5)$ is a cyclic group where G={0,1,2,3,4}

c) Explain Rings and fields in detail with suitable examples.

Q 4. (2X7=14)

a) Determine whether the following is a tautology, contingency and contradiction :

(i) $(p\wedge\sim q)\ v\ (\sim p\wedge q)$ (ii) $(p\rightarrow q)\rightarrow[p\rightarrow(p\wedge q]$

b) Explain modus ponens ,modus tollens and Hypothetical syllogism with the help of suitable example.

c) Prove the validity of the following arguments without using truth tables

(i) $p, p\rightarrow q, q\rightarrow r \vdash r$

(ii) $p\rightarrow(qvr),(s\wedge t)\rightarrow q,(qvr)\rightarrow(s\wedge t)\vdash p\rightarrow q$

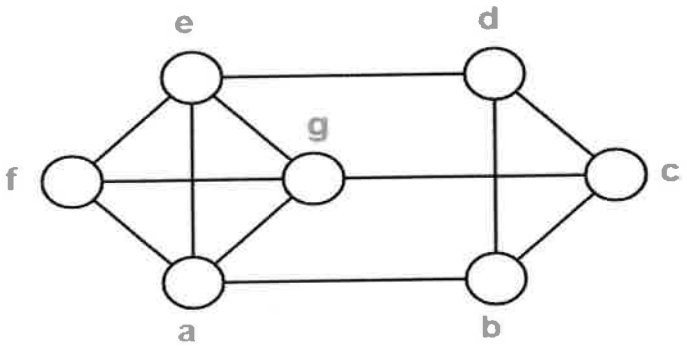
Q 5. (2X7=14)

a) What is Hamiltonian path and circuits explain it with the help of the example.

b) Construct a BST (Binary search tree) for the given post order traversal.

Postorder: m n k o u v s t q r p l j

c) What is chromatic number of a graph. Find the chromatic number of the following graph



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Programme: Master of Computer Applications **Session: 2021-22**

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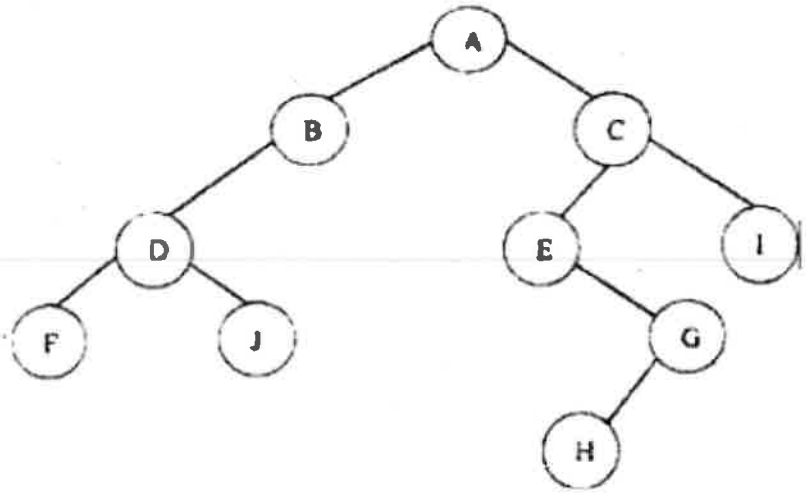

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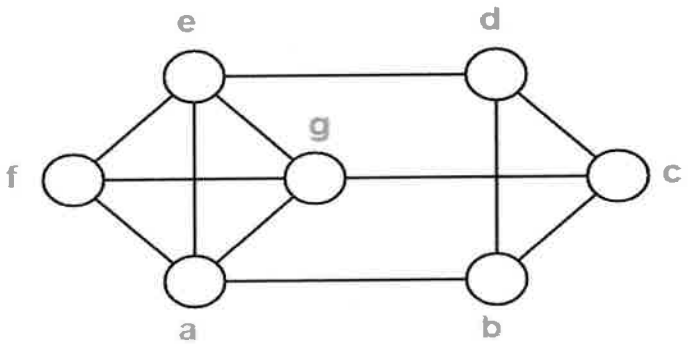

CENTRAL UNIVERSITY OF HARYANA

End Semester Examinations April 2022

Programme: Master of Computer Applications | **Session: 2021- 2022**
Semester: First | **Max. Time: 3 Hours**
Course Title: Fundamentals of Computer Science | **Max. Marks: 70**
Course Code: SBS CS 01 01 01 E 3104

Instructions:

1. Question no. 1 has seven parts and students need to answer any four. Each part carries three and half Marks.

2. Question no. 2 to 5 have three parts and student need to answer any two parts of each question. Each part carries seven marks.

Q 1. **(4X3.5=14)**

a) How trackball works.

b) What is memory? Discuss its basic units.

c) Discuss about ALU & CPU.

d) What is memory? Explain about E-ROM.

e) How booting process is done?

f) Discuss about Templates.

g) What are various type of Computers? Explain about main frame Computers.

Q 2. **(2X7=14)**

a) What do you mean by computer? Discuss the various input and output devices in detail.

b) Discuss the working of magnetic tape and magnetic disk.

c) What is printer? Discuss various types of printers and their working.

Q3. **(2X7=14)**

a) Explain the concept of Volatile and Non Volatile Memory with help of example.

b) Discuss the primary and secondary memory. What are specific use of these memories?

c) Explain the following:

- RAM
- ROM

Q 4. **(2X7=14)**

a) What is operating system? Also discuss about Graphics operating system.

b) Explain the features of operating system in detail.

c) Discuss the functions of operating system.

Q 5. **(2X7=14)**

a) What do you mean by mail? Why mail merging is used.

b) Explain about various formatting features of Word Processing tools.

c) Discuss the Power Point Slide in detail also write its advantages.

CENTRAL UNIVERSITY OF HARYANA

End Semester Examinations April 2022

Programme: Master of Computer Applications **Session: 2021-22**

Semester: First **Max. Time: 3 Hours**

Course Title: Data Structures **Max. Marks: 70**

Course Code: SBS CS 01 01 01 C 4004

Instructions:

1. Question no. 1 has seven parts and students need to answer any four. Each part carries three and half Marks.

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Q 1. (4X3.5=14)

a) Differentiate between array and linked list data structures.

b) Describe about Binary Search Tree.

c) What is Graph and its characteristics?

d) How sequential representation of graph can be done?

e) What do you mean by best case, average case and worst case time complexity of an algorithm? Also explain the time complexity of selection sort and quick sort algorithms.

f) Convert following Infix expression to postfix expression using stack in Tabular method
Infix Expression:- **m*n+(p-q)+r**

g) Differentiate between LIFO & FIFO algorithms.

Q 2. (2X7=14)

a) What do you mean by Asymptotic Notation? Explain it with help of suitable examples.

b) What do you understand by data structure? Describe the classification of data structures.

c) What is an array? Describe the representation of array in memory. Write a program using array.

Q3. (2X7=14)

a) What is stack? Describe the array representation of the stack with the help of the suitable functions for operations on it.

b) What is Dequene? What operations are applied on it? Write any two applications of Dequene.

c) Explain about the Implementation of the doubly linked list. What is its advantages & disadvantages?

Q 4. (2X7=14)

a) Construct an AVL tree having the following elements H, I, J, B, A, E, C, F, D, G, K, L Show all the steps.
b) What do you mean by traversal of graph? Illustrate its mechanisms.
c) What is Binary Tree? Describe its types with help of suitable examples.

Q 5. (2X7=14)

a) Explain about selection sort. Also discuss its complexity with help of suitable example.
b) What is Heap Sort? How is it implemented? Explain through suitable example and discuss its complexity.
c) What do you mean by Hash function? Describe various types of Hash Functions and its applications.

CENTRAL UNIVERSITY OF HARYANA

End Semester Examinations April 2022

Programme: Master of Computer Application **Session: 2021-22**

Semester: First **Max. Time: 3 Hours**

Course Title: Internet Fundamentals **Max. Marks: 70**

Course Code: SBS CS 01 01 02 E 3104

Instructions:

1. Question no. 1 has seven parts and students need to answer any four. Each part carries three and a half Marks.
2. Question no. 2 to 5 have three parts and students need to answer any two parts of each question. Each part carries seven marks.

Q 1. (4X3.5=14)

a) How does client-server model works?

b) Explain anchor tag and image tag with syntax. How is a hyperlink created for a document?

c) What makes a valid e-mail address?

d) Write any four advantages and disadvantages of Internet.

e) Write a short note on (Internet Service Providers) ISPs.

f) Explain the term *Internet Congestion* briefly.

g) What are the various types of networks? Explain briefly.

Q 2. (2X7=14)

a) Explain chat rooms and chatting in detail. How it differs from news group.

b) What is E-mail? Describe different components of an E-mail message with the help of an example.

c) Explain the different operations that can be performed on an E-mail. How MIME is useful in email?

Q 3. (2X7=14)

a) What is Internet Addressing? Given IP Address – 172.16.0.0/25, calculate the number of subnets and the number of hosts per subnet. Also, for the first subnet block, find out the subnet address, first host ID, last host ID and broadcast address.

b) How IPv4 different from IPv6? Explain the structure of an IPv4 and IPv6 header with help of diagram.

c) What do you mean by Internet? How Internet works? What are the various methods of connecting to the internet?

Q 4. (2X7=14)

a) What are various scripting languages? Explain about HTML and XML in brief?

b) Explain working of IIS. Also discuss its features and applications?

c) Write HTML code to draw polygon on a canvas.

Q 5. (2X7=14)

a) Explain the different types of web documents along with their advantages and disadvantages.

b) What is firewall? How does a firewall system works? Also state the limitations of a firewalls.

c) Explain the various types of Public Key Encryption Techniques.

CENTRAL UNIVERSITY OF HARYANA

End Semester Examinations April 2022

Programme: Master of Computer Application **Session: 2021- 2022**
Semester: First **Max. Time: 3 Hours**
Course Title: Computer Programming using C **Max. Marks: 70**
Course Code: SBS CS 01 01 03 E 3104

Instructions:

1. Question no. 1 has seven parts and students need to answer any four. Each part carries three and half Marks.

2. Question no. 2 to 5 have three parts and student need to answer any two parts of each question. Each part carries seven marks.

Q 1. **(4X3.5=14)**

a) What are the various bitwise operators in C Programming?

b) Explain "go to" statement with the help of suitable example.

c) What is "Default" case in switch statement? Give Suitable examples.

d) Explain "break and continue" statements in looping with example.

e) What are the various advantages and disadvantages of array?

f) Describe "recursion" function with suitable example.

g) Describe the sequencing and selection.

Q 2. **(2X7=14)**

a) Explain the relational, logical and conditional operators with the help of example.

b) Explain various data types available in C language in detail.

c) Explain the hierarchy and associativity of operators in C language with the help of suitable example.

Q 3. **(2X7=14)**

a) What is switch statement? Explain in detail with the help of suitable examples.

b) Describe the following Control statements with the help of example.

- If statement
- If-else statement
- If else ladder

c) What is looping? Explain "for" and "do while" loop through suitable examples.

Q4. **(2X7=14)**

a) What is function calling? Explain call by value and call by reference using suitable examples.

b) Give Differences between actual and formal parameters with the help of example.

c) What are the various function available in C Programming? Explain through suitable examples.

Q 5. **(2X7=14)**

a) Explain the differences between array and structure with suitable examples.

b) How structure is different from Union? Explain in detail.

c) Write short note on: **1.Pointers 2. Array to pointers**