

4th Sem, **Branch** : Computer Engineering**Subject** : Data Structures using "C"**Time** : 3 Hrs.**M.M.** : 100**SECTION-A****Note** : Multiple choice questions. All questions are compulsory. (10x1=10)

Q.1 How can we describe an array in the best possible way? (CO-3)

- a) The array shows a hierarchical structure.
- b) Arrays are immutable.
- c) Container that stores the elements of similar types
- d) The Array is not a data structure.

Q.2 How can we initialize an array in C language? (CO-3)

- a) `int arr[2] = (10,20)`
- b) `int arr(2) = {10,20}`
- c) `int arr[2] = {10,20}`
- d) `int arr(2) = (10,20)`

Q.3 Which one of the following is the process of removing an element from the stack? (CO-3)

- a) Insert
- b) Push
- c) Pop
- d) None of the above

Q.4 If the size of the stack is 10 and we try to add the 11th element in the stack then the condition is known as _____. (CO-3)

- a) Underflow
- b) Garbage collection
- c) Overflow
- d) None of the above

Q.5 Which data structure is required to convert the infix to prefix notation? (CO-2)

- a) Stack
- b) Linked list
- c) Binary tree
- d) Queue

Q.6 Which of the following is the prefix form of $A+B*C$? (CO-2)

- a) $A+(BC*)$
- b) $+AB*C$
- c) $ABC+*$
- d) $+A*BC$

Q.7 Which of the following is not the correct statement for a stack data structure? (CO-3)

- a) Arrays can be used to implement the stack
- b) Stack follows FIFO
- c) Elements are stored in a sequential manner
- d) Top of the stack contains the last inserted elements.

Q.8 If the elements '1', '2', '3' and '4' are inserted in a queue, what would be order for the removal? (CO-3)

- a) 1234
- b) 4321
- c) 3241
- d) None of the above

Q.9 The necessary condition to be checked before deletion from the queue is _____. (CO-3)

- a) Overflow
- b) Underflow
- c) Rear value
- d) Front value

Q.10 Which of the following statement is not true about the doubly linked list. (CO-3)

- a) We can traverse in both the directions.
- b) It requires extra space.
- c) Implementation of doubly linked list is easier than the singly linked list

- d) It stores the addresses of the next and the previous node.

SECTION-B

Note: Objective type questions. All questions are compulsory. (10x1=10)

- Q.11 Variable that stores address of another variable is called _____. (CO-1)
- Q.12 Define Algorithm. (CO-1)
- Q.13 Sequence of instructions written in English language to solve a particular problem is called? (CO-1)
- Q.14 Define Data Structure. (CO-2)
- Q.15 The maximum level of any leaf in the tree is known as _____ of the tree. (CO-5)
- Q.16 BST stand for _____. (CO-5)
- Q.17 The Pre-order traversal of a binary Tree starts with processing of _____ node. (CO-5)
- Q.18 Tree is _____ Data Structure. (CO-5)
- Q.19 Elements in an array are accessed (Randomly/sequentially). (CO-3)
- Q.20 Process of inserting an element in stack is called _____. (CO-3)

SECTION-C

Note: Short answer type questions. Attempt any twelve questions out of fifteen questions. (12x5=60)

- Q.21 Write an algorithm to traverse a binary tree in pre-order. (CO-5)
- Q.22 Write down a Binary search algorithm. (CO-5)
- Q.23 Define sorting. Name different sorting algorithms. (CO-6)
- Q.24 Define the following terms in Trees with a suitable diagram: i) Path ii) Height. (CO-5)

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- Q.25 Differentiate between similar binary tree and copy of a binary tree. (CO-5)
- Q.26 How a 2-D array is represented in the memory? (CO-3)
- Q.27 Define Traversing. Write down traversing algorithm of an array. (CO-3)
- Q.28 Define the following terms related to arrays: (CO-3)
i) Base address ii) Index of an element.
- Q.29 Write down an algorithm to illustrate stack operations using arrays. (CO-3)
- Q.30 Discuss various applications of queues. (CO-2)
- Q.31 Convert the following infix expression into its equivalent prefix and postfix expressions. (CO-2)
 $A+(B+C)/D-E*(F/G*H)$
- Q.32 Explain various characteristics and uses of Recursion. (CO-2)
- Q.33 Show the basic structure of a node in a linked list. Why pointer field is used in a node? (CO-3)
- Q.34 Define doubly linked list. Write down an algorithm to insert a node into a doubly linked list. (CO-3)
- Q.35 Differentiate between primitive and non-primitive data structures. (CO-2)

SECTION-

Note: Long Answer type question. Attempt any two questions out of three questions. (2x10=20)

- Q.36 Explain linked list implementation of stack. (CO-3)
- Q.37 Define a Binary Search Tree. Using an algorithm show how an element can be inserted into it? (CO-5)
- Q.38 Discuss quick sort algorithm with suitable example. (CO-6)

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