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S. Y. B. Tech. (Part - II) (Semester - IV) (CBCS)**Examination, May - 2025****Electronics and Tele.com****Data Structure****Sub. Code : 79185 / 79473****Day and Date : Monday, 19/05/2025****Total Marks : 70****Time : 10.30 a.m. to 1.00 p.m.****Instructions : 1) All questions are compulsory.****2) Figures to the right indicate full marks****Q. 1 Solve the Multiple-Choice Questions.****(14)**

- 1) A data structure in which linear sequence is maintained by pointers is known as.....
- (A) Array (B) Stack
(C) Linked list (D) Pointer-based data structure
- 2) A is a linear collection of self-referential structures, called nodes, connected by pointer links.
- (A) Queue (B) Linked list
(C) Tree (D) Stack
3. Which of the following is not a linear data structure?
- (A) Stack (B) Queue
(C) Linked list (D) Binary tree
4. Which of the following data structure permits insertion and deletion operations only on one end of the structure?
- (A) Linked list (B) Array
(C) Stack (D) Queue

5. What is the time complexity of inserting at the end in dynamic arrays?
- (A) $O(1)$ (B) $O(n)$
(C) $O(\log n)$ (D) Either $O(1)$ or $O(n)$
6. Pointer is a
- (A) variable that stores address of an instruction
(B) variable that stores address of other variable
(C) keyword used to create variables
(D) None of these
7. How can we initialize an array in C language?
- (A) `int arr[2]=(10, 20)` (B) `int arr(2)={10, 20}`
(C) `int arr[2] = {10, 20}` (D) `int arr(2) = (10, 20)`
8. The number of edges from the node to the deepest leaf is called of the tree.
- (A) Height (B) Depth
(C) Length (D) Width
9. Pop Operation in stack is.....
- (A) Adding Elements (B) Removing Elements
(C) Traversing (D) None of these
10. Which data structure is suitable for Postfix to Infix evaluation?
- (A) QUEUE (B) Array
(C) STACK (D) TREE
11. What is a hash table?
- (A) A structure that maps values to keys
(B) A structure that maps keys to values
(C) A structure used for storage
(D) A structure used to implement stack and queue

12. The five items : A, B, C, D and E are pushed in stack, one after the other starting from A. The stack is popped four items and each element is inserted in a queue. Then two elements are deleted from the queue and pushed back on the stack. Now one item is popped from the stack. The popped item is

- (A) B (B) C
(C) D (D) E

13. The number of elements in the adjacency matrix of a graph having 7 vertices is

- (A) 7 (B) 14
(C) 36 (D) 49

14. Heap can be used as

- (A) Priority queue (B) Stack
(C) A decreasing order array (D) Normal Array

Q.2) Attempt any two questions. (14)

1. What is time complexity and space complexity?
2. Explain abstract data type with an example.
3. Write in detail insertion and deletion of nodes of linked list.

Q.3) Attempt any two questions. (14)

1. Explain parallel arrays.
2. Explain Header linked list.
3. Explain Binary Search with an example.

Q.4) Attempt any two questions.**(14)**

1. Explain the different operations related to stack.
2. Convert the following infix notation into postfix notation using stack.

$$10 + (3 * 5 + (27 / 3 \uparrow 2) * 6) * 4$$

3. Write an algorithm to insert element into Queue.

Q.5) Attempt any two questions.**(14)**

1. Explain Post-order traversing of tree.
 2. Explain threaded binary tree.
 3. What is Hashing? Explain hash functions.
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