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Reg. No. : .....

Code No. : 20484 E Sub. Code : CMCS 41

B.Sc. (CBCS) DEGREE EXAMINATION,  
NOVEMBER 2023.

Fourth Semester

Computer Science – Core

DATA STRUCTURES

(For those who joined in July 2021-2022)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer:

1. 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)

6. What is the traversal strategy used in the binary tree?

- (a) depth-first traversal
- (b) breadth-first traversal
- (c) random traversal
- (d) priority traversal

7. A connected planar graph having 6 vertices, 7 edges contains \_\_\_\_\_ regions.

- (a) 15
- (b) 3
- (c) 1
- (d) 11

8. A graph with all vertices having equal degree is known as a \_\_\_\_\_

- (a) Multi Graph
- (b) Regular Graph
- (c) Simple Graph
- (d) Complete Graph

9. Which of the following is not in place sorting algorithm?

- (a) Selection sort
- (b) Heap sort
- (c) Quick sort
- (d) Merge sort

2. Which one of the following is the size of int arr[9] assuming that int is of 4 bytes?

- (a) 9
- (b) 36
- (c) 35
- (d) 40

3. Process of removing an element from stack is called \_\_\_\_\_

- (a) Create
- (b) Push
- (c) Evaluation
- (d) Pop

4. What is the worst case time complexity of inserting a node in a doubly linked list?

- (a)  $O(n \log n)$
- (b)  $O(\log n)$
- (c)  $O(n)$
- (d)  $O(1)$

5. How many children does a binary tree have?

- (a) 2
- (b) any number of children
- (c) 0 or 1 or 2
- (d) 0 or 1

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10. What is an internal sorting algorithm?

- (a) Algorithm that uses tape or disk during the sort
- (b) Algorithm that uses main memory during the sort
- (c) Algorithm that involves swapping
- (d) Algorithm that are considered 'in place'

PART B — (5 × 5 = 25 marks)

Answer ALL the questions, choosing either (a) or (b).

Each answer should not exceed 250 words.

11. (a) Write short notes on Pointers.

Or

(b) Explain — How Represent a Multidimensional Arrays?

12. (a) Elucidate Stack and its functions.

Or

(b) Write short notes on Sparse Matrix

13. (a) Discuss the Terminology of Tree.

Or

(b) Write short notes on Forest Traversals.

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14. (a) Discuss about Depth First Search.

Or

(b) Explain the Activity on Vertex Networks.

15. (a) Discuss about Insertion Sort.

Or

(b) Write short notes on Hashing.

PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 600 words.

16. (a) Describe the various phases in System Life Cycle.

Or

(b) Write an Algorithm for Polynomial Addition.

17. (a) Explain how to add and delete items in a Queue.

Or

(b) Discuss about Doubly Linked List.

18. (a) Write detail notes on Binary Tree Traversals.

Or

(b) Explain the joining and Splitting of a Binary Search Tree.

19. (a) Describe Kruskal's Algorithm.

Or

(b) Write detail notes on Spanning Tree.

20. (a) Discuss about Quick Sort.

Or

(b) Write detail notes on K-way Merging.