S.No. 7393 PN 15 IT 1

(For candidates admitted from 2015–2016 onwards)

M.Sc. DEGREE EXAMINATION, NOVEMBER 2023

Information Technology

DATA STRUCTURES AND ALGORITHMS

Time : Three hours Maximum : 100 marks

PART A — (10 × 2 = 20)

Answer ALL questions.

1. Write down the definition of data structures.
2. Define Space Complexity.
3. What is meant by strongly connected in a graph?
4. What is an Abstract Data type (ADT)?
5. Name the three fields of Doubly Linked list.
6. Write postfix from of the expression —A+B-C+D
7. What are the different types of algorithms?
8. Define hill Climbing.

9. Write down the algorithm for solving Towers of Hanoi problem.

10. What are the types of buddy system?

PART B — (5 × 7 = 35)

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

11. (a) Explain about Single and Multidimensional array with an example.

Or

(b) Define Stack. Discuss about Applications of stack.

12. (a) Explain about Circular linked list with neat sketches.

Or

(b) Elucidate Insertion. Deletion and Recursive Operations in Binary Search Tree.

13. (a) Write an algorithm for the depth first search of a graph?

Or

(b) Explain the Prim's algorithm to find minimal spanning tree for a graph.

14. (a) Discuss Floyd's algorithm in detail

Or

(b) Explain about the comparison of Sorting Techniques.

15. (a) Explain any algorithm for all pairs shortest path problem.

Or

(b) Explain Dijkstra's algorithm with an example.

PART C — (3 × 15 = 45)

Answer any THREE questions.

16. Write an algorithm for insert and delete a node from doubly linked list.

17. Write the linear search algorithm and analyze for its best, worst and average cast time complexity.

18. Explain about graph colouring problem with examples.

19. Discuss the Knapsack problem in Greedy techniques with an example.

20. Explain in detail about Travelling Salesperson problem with suitable examples.

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