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C16-CM-IT–304

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BOARD DIPLOMA EXAMINATION, (C-16)

AUGUST/SEPTEMBER—2021

DCME - THIRD SEMESTER EXAMINATION

DATA STRUCTURES THROUGH C

Time : 3 hours] [*Total Marks* : 80

PART—A

Instructions : (1) Answer all questions.

(2) Each question carries three marks.

(3) Answers should be brief and straight to the point and shall not exceed five simple sentences.

1. Define nonlinear data structure and give examples. 2+1
2. Write about Abstract Data Structure (ADT). 3
3. What is linked list? List the advantages of doubly linked list over singly Linked list. 2+1
4. Write the purpose of dummy header. 3
5. Define Priority Queue. List the applications of Priority Queues. 1+2
6. If a = 20, b = 4 and c = 3, then evaluate the postfix expression and find its value ab+c/. 3
7. Define the terms *(a)* subtree, *(b)* external node and *(c)* degree of a node. 1+1+1
8. Write the differences between binary tree and binary search tree. 3
9. List various sorting techniques. Which sorting method is fastest among all? 2+1
10. What is searching? Write the need for searching. 2+1

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PART—B

Instructions : (1) Answer *any* five questions.

(2) Each question carries ten marks.

(3) Answers should be comprehensive and criterion for valuation is the content but not the length of the answer.

11. Write a C program to create and display a Doubly Linked List. 10

12. Explain about insertion and deletion of elements in a single linked list with examples. 10

13. *(a)* Write the algorithm for converting an infix expression into a postfix expression. 5

(b) Convert the given infix expression into postfix notation (A+B)*C/D. 5

14. Write a C program to implement Queue using arrays. 10

15. *(a)* Explain about various representations of a binary tree. 5

(b) Construct a binary tree for the given inorder and postorder traversals : 5

Inorder traversal : BDAECF Postorder Traversal : DBEFCA

16. Explain various binary tree traversal methods with algorithms and examples. 10

17. Explain insertion sort method with program and example. 10

18. *(a)* Write the algorithm for bubble sort. 5

(b) Explain binary search method with example. 5

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