C16-CM-IT–304

6230

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

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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