



C14-CM-305/C14-IT-305

4235

BOARD DIPLOMA EXAMINATION, (C-14)
MARCH/APRIL—2017
DCME—THIRD SEMESTER EXAMINATION

DATA STRUCTURES THROUGH C

Time : 3 hours]

[Total Marks : 80

PART—A

3×10=30

- 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 data structure and classify it. 1+2=3
2. Explain data types and abstract data types. 1½+1½=3
3. State the major differences between linked list and circular linked list. 3
4. Write the advantages of double-linked lists. 1×3=3
5. Write the applications of stacks. 1×3=3
6. What is circular queue? 3
7. Define the following terms of a tree : 1×3=3
 - (a) Root node
 - (b) Child node
 - (c) Leaf node

- * 8. Explain about postorder traversal of a binary tree. 3
9. Write the working principle of quick sort. 3
10. Define searching. 3

PART—B

10×5=50

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

(2) Each question carries **ten** marks.

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

11. Write a program to create a single-linked list. 10
12. Formulate an algorithm which will perform an insertion to the immediate left of the *K*th node in the double-linked list. 10
13. Write a C program to evaluate postfix expression. 10
14. What is circular queue? Write a C program to implement circular queue using arrays. 2+8=10
15. Explain with an example to convert any tree into binary tree. 10
16. Write an recursive algorithm for inorder, preorder and postorder traversals of a binary tree. 10
17. Write a C program to implement quicksort method. 10
18. (a) Explain how the complexity is calculated for bubble sort. 5
- * (b) Modify the linear search algorithm so that in the case of an unsuccessful search it returns the index—(i) such that $K[i] < \text{Key} < K[i+1]$, if $\text{Key} < K[0]$, it returns -1 and $\text{Key} > K[n-1]$, it returns $n-1$ (n is total of elements). 5
