CBCS SCHEME

USN | | | | | | | | | |

18MCA22

Second Semester MCA Degree Examination, Jan./Feb. 2021
Data Structures Using C++

Time: 3 hrs. Max. Marks: 100

Note: ***Answer any FIVE full questions, choosing ONE full question from each module.***

Module-1

1 a. What is a data structure? What are the various operations that can be performed on different Data structure? **(10 Marks)**

b. Represent Array as an ADT with its operations. **(06 Marks)**

c. Discuss the various character string operations. **(04 Marks)**

OR

2 a. Define Stack. Write a program to implement the primitive operations of stack. **(10 Marks)**

b. Write an algorithm to evaluate a postfix expression. Evaluate the following postfix expression 53 + 62|*35*+ **(10 Marks)**

Module-2

3 a. Write a C++ program to solve tower of Hanoi problem. Trace the same for n = 3 disks. **(10 Marks)**

b. Discuss the properties of recursive definitions. List out the differences between iterative and recursive approach. **(10 Marks)**

OR

4 a. What is a queue? Write algorithm for the primitive operations performed on a queue. **(10 Marks)**

b. Define a circular Queue. Explain its advantages over ordinary queue. **(06 Marks)**

c. Write a note on applications of Queue. **(04 Marks)**

Module-3

5 a. Define linked list. Explain in detail about inserting and deleting nodes from a linked list. **(10 Marks)**

b. Explain linked implementation of queue with suitable diagrams. Write algorithm to implement queue using singly linked list. **(10 Marks)**

OR

6 a. What is doubly linked list? Explain how to delete a specified node from a doubly linked list. **(10 Marks)**

b. What are circular linked list? Write function to perform insertion and deletion operation in a circular linked list. **(10 Marks)**

Module-4

7 a. Define a tree. Discuss the different terminologies of a tree. **(10 Marks)**

b. Write a C++ program to traverse a given binary tree in preorder, inorder and postorder. **(10 Marks)**

OR

8 a. What is Binary Search Tree (BST)? Construct a BST for the following data and traverse in inorder preorder and postorder.
14, 15, 4, 9, 7, 18, 3, 5, 16, 20. **(10 Marks)**

b. Write the linked representation of binary tree. **(05 Marks)**

c. Explain the process of insertion of a node into a Binary Search Tree **(05 Marks)**

Module-5

9 a. What is Selection sort? Perform selection sort for the inputs 23, 15, 29, 11, 1 and trace the same. **(10 Marks)**

b. Write a C++ program for quick sort. **(10 Marks)**

OR

10 a. Write a C++ program for linear search and explain with an example. **(10 Marks)**

b. Briefly explain different hash collusion resolution techniques. **(10 Marks)**

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