CBCS SCHEME

15EC661

Sixth Semester B.E. Degree Examination, Aug./Sept. 2020
Data Structure using C++

Time: 3 hrs.

Max. Marks: 80

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

Module-1

1 a. Explain dynamic memory allocation using suitable diagrams. **(06 Marks)**
   b. What do you mean by linked lists? Explain the concept of insertion and deletion of nodes of linked lists using C++. **(10 Marks)**

OR

2 a. Explain recursion. Write a recursive function in C++ to find the factorial of a number. **(10 Marks)**
   b. Write a program in C++ to traverse along the nodes of a linked lists. **(06 Marks)**

Module-2

3 a. Write a C++ program to multiply two matrices. **(10 Marks)**
   b. Using the concept of stacks implement switch Box Routing. **(06 Marks)**

OR

4 a. Write a C++ program to transpose a given sparse matrix. **(10 Marks)**
   b. Explain how parenthesis matching is carried out using stacks. **(06 Marks)**

Module-3

5 a. What are advantages of circular queue over simple queue? **(04 Marks)**
   b. Write pseudo code for the following queue operations using array implementation
      i) ISempty ( )   ii) Enque ( )   iii) Deque ( ). **(05 Marks)**
   c. Write short notes on Hashing? **(07 Marks)**

OR

6 a. Discuss problem description and solution strategy for rail car arrangement. **(09 Marks)**
   b. Explain how overflow condition is eliminated using hashing with chains. Compare with linear probing method. **(07 Marks)**

Module-4

7 a. Draw the binary expression trees corresponding to each of the following expressions.
      i) $(-A) + (X + Y))/((+B) * (C*A))$ ii) $((A + B) + C) + d$. **(08 Marks)**
   b. Write functions for : i) Pre – order traversal of a binary tree
                            ii) Determining height of the binary tree. **(08 Marks)**

OR

8 a. Write ADT of a binary tree. **(08 Marks)**
   b. Write pre-order, in-order and post-order traversals for the tree given below :
      Pre –order ABDGEHKMCFILJ
      Post – order GDMKHEBLIJFCA
      In – order GDBEKMHACILFJ. **(08 Marks)**

Module-5

9 a. Write a C++ function to delete elements from max heaps. **(10 Marks)**
   b. What is priority queue? Explain operations performed on priority queues. **(06 Marks)**

OR

10 a. Write a function to insert an element in Binary Search Trees **(10 Marks)**
    b. Discuss Binary Search Tree with duplicates. **(06 Marks)**

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