CBCS SCHEME

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15EC661

Sixth Semester B.E. Degree Examination, June/July 2019
Data Structures 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. Discuss template function in C++. Write template function to swap two parameters with arguments being two integers or two float values. **(06 Marks)**

b. Explain how dynamic memory allocation or de-allocation is performed in C++ with suitable example. **(06 Marks)**

c. Write ADT specification for linear lists. **(04 Marks)**

OR

2 a. Briefly explain recursion. Write recursive function in C++ to find factorial of number. **(06 Marks)**

b. Write class definition for arrayList. **(05 Marks)**

c. Write a struct definition for chain node. **(05 Marks)**

Module-2

3 a. Write a C++ program to add two matrices. **(06 Marks)**

b. Explain how parenthesis matching is carried out using stacks. Write a C++ function for the same. **(10 Marks)**

OR

4 a. Define sparse matrix and also explain the representation of sparse matrix using single linear list. **(06 Marks)**

b. Explain the row-major representation of a multi-dimensional array. **(06 Marks)**

c. Write a get function or method for diagonal matrix. **(04 Marks)**

Module-3

5 a. What is the advantage of circular queue over simple? With neat diagrams explain how array length can be doubled in a circular queue. **(10 Marks)**

b. With the help of an ADT explain dictionaries. **(06 Marks)**

OR

6 a. Discuss problem description and solution strategy for rail road car rearrangement. **(08 Marks)**

b. What is hashing? Explain the hashing functions and tables. **(08 Marks)**

Module-4

7 a. Define binary tree and also mention the essential differences between a binary tree and tree. **(04 Marks)**

b. Draw the binary expression trees corresponding to each of the following expressions. **(06 Marks)**

c. List and explain the different binary tree traversal methods. **(06 Marks)**

OR

8 a. Write short notes on Linked representations of binary trees. **(10 Marks)**

b. State and prove any three properties of binary trees. **(06 Marks)**

Module-5

9 a. Define a binary search tree and also write a function to search for an element in binary search trees. **(08 Marks)**

b. Explain the operations insertion and deletion for MaxHeaps. **(08 Marks)**

OR

10 a. Write a function for Heap sort and explain Heat sort with neat diagrams. **(10 Marks)**

b. Write a function to insert an element into a binary search tree. **(06 Marks)**

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