Hall Ticket No | | | | | | | | | | | Question Paper Code: BCS002

INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

M.Tech I Semester End Examinations (Supplementary) - January, 2019

Regulation: IARE–R16

DATA STRUCTURES AND PROBLEM SOLVING

Time: 3 Hours **(CSE)** **Max Marks: 70**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the question must be answered in one place only

UNIT – I

1. (a) Explain how insertions and deletions are done in a circular linked list. **[7M]**
   (b) Explain the concept of ADT with the example of the priority queue ADT. **[7M]**
2. (a) Describe the Big Oh, Omega and Theta notations with an example. **[7M]**
   (b) Explain the operations of insertion and deletion into a max heap with an example. **[7M]**

UNIT – II

3. (a) What is double hashing? Insert the keys 76,93,40,47,10,55 into a hash table of seven elements using double hashing, using the second hash function Hash2(key) = 5 - (key % 5) and show the contents of the hash table at each stage. **[7M]**
   (b) Explain with an example how hash table collisions are resolved using linear probing. **[7M]**
4. (a) What is rehashing? When is rehashing done? **[7M]**
   (b) Explain the linear list representation of dictionaries. Also explain how insertion and search operations are done in such dictionaries. **[7M]**

UNIT – III

5. (a) How is non-recursive traversal of a binary tree done? Explain with an example **[7M]**
   (b) With an example, trace the working of the Djikstra's algorithm for single source shortest path problem. **[7M]**
6. (a) What are threaded binary trees? Give an example. **[7M]**
   (b) Write the algorithm for finding the minimum cost spanning tree proposed by Kruskal. **[7M]**

UNIT – IV

7. (a) Write an algorithm for insertion of an element into a binary search tree. **[7M]**
   (b) Create a binary search tree by repeated insertion of the following elements : 50, 70, 20, 10, 30, 67, 89, 12, 14. Now, delete element 20 and draw the resultant tree. **[7M]**

8. (a) How do you find the smallest and largest numbers in a binary search tree? **[7M]**

   (b) What is an AVL tree? Describe when and how an RR rotation is performed in an AVL tree. **[7M]**

UNIT – V

9. (a) Illustrate Huffman coding for compression with an example. **[7M]**

   (b) What is a red-black tree? Explain the insertion operation into a red-black tree with an example. **[7M]**

10. (a) What are the B trees and write any three applications of B trees? **[7M]**

    (b) Explain the working of the nearest neighbor query in an B tree. **[7M]**

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