Reg. No.										

MANIPAL ACADEMY OF HIGHER EDUCATION, MANIPAL
MANIPAL SCHOOL OF INFORMATION SCIENCE, MANIPAL

FIRST SEMESTER MASTER OF ENGINEERING – ME (VLSI DESIGN) DEGREE EXAMINATION – APRIL 2021 (MAKE UP EXAM)

SUBJECT: CSE 606 – DATA STRUCTURES

Wednesday, April 14, 2021

Time: 9.30 – 12.30 Hrs. Max.Marks:100

Answer all questions. All questions carry 10 marks.

1. Design data structure for single linked list. Write function to insert an element at any position .(TLO: 2.2) (2+8 =10 marks)

2. What is stack? Define data structure of linked list based stack. Write linked list implementation of PUSH(), POP() and PEEK() functions. (TLO:2.2) (1+ 2+ 3+3 +1=10 marks)

3. What is Queue? What are the advantages of circular queue over normal queue? Write functions to add to queue and delete from circular queue. (TLO: 2.2) (2+2+3+3=10 marks)

4. List the properties of Binary Search Tree (BST). Design data structure for BST. Write inorder, preorder and postorder traversal techniques (TLO: 4.1) (2+2+6 =10 marks).

5. What is hashing? What are the advantages of hash table? Define data structure to store integer values in hash table of size 10. Write function to initialize the hash table (TLO:4.3) (2+2+2+4=10 marks)

6. Write a program to sort the elements of an array using merger sort. What are the advantage and disadvantage of merge sort? (TLO:3.2) (8+2 = 10 Marks)

7. What is Minimum Spanning Tree? Write pseudo code for Prims's algorithm and Kruskal's Algorithm to find Minimum Spanning Tree. (TLO: 4.2) (2+4+4=10 marks)

8. Consider a graph with 5 Vertices and represent the graph using Adjacency list. Traverse the graph using DFS and BFS Technique. (TLO: 4.2) (2+4+4 =10 marks)

9. Given two linked list A and B, Create linked list C = A minus B. Define the data structure for the following problem and write the function List * minus(List *, List *). Note: Assume List * Initialize_list(); List * insert_at end(List *, int) is implemented .(TLO:3.1; TLO: 2.1; TLO:2.2)

(2+8=10 marks)

10. With require data structure, Write a program to store integer values in a linked list. Write two separate functions to find maximum and minimum element in O(1) time.

(TLO: 2.1; TLO:2.2) (2+4+2+2=10 marks)

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