LAST MOMENT TUITIONS

Data Structures

MAY 18

Computer Engineering (Semester 3)

Total marks: 80
Total time: 3 Hours

INSTRUCTIONS
(1) Question 1 is compulsory.
*(2) Attempt any **three** from the remaining questions.*
(3) Draw neat diagrams wherever necessary.

1(a) Explain different types of data structures with example. (5 marks)
1(b) What is a graph? Explain methods to represent graph. (5 marks)
1(c) Write a program is 'C' to implement Merge sort (10 marks)

2(a) Write a program in 'C' to implement QUEUE ADT using linked-list.
Perform the following operations:

- (i) Insert a note in the Queue.
- (ii) Delete a node from the Queue.
- (iii) Display Queue elements (10 marks)

2(b) Using Linear probing and Quadratic probing, insert the following values in the hash table of size 10. Show how many collisions occur in each iternation: 28, 55, 71, 67, 11, 10, 90, 44 (10 marks)
3(a) Write a program in 'C' to evaluate postfix expression using STACK ADT (10 marks)

3(b) Explain different types of tree traversals techniques with example. Also write recursive function for each traversal technique. (10 marks)

4(a) State advantages of Linked-List over arrays. Explain different applications of Linked-list. (10 marks)
4(b) Write a program in 'C' to implement Circular Queue using arrays. (10 marks)

5(a) Write a program to implement Singly Linked List.
Provide the following operations:

- (i) Insert a node at the specified location
- (ii) Delete a node from end
- (iii) Display the list (10 marks)

5(b) Insert the following elements in AVL tree: 44, 17, 32, 78, 50, 88, 48, 62, 54.
Explain different rotations that can be used. (10 marks)

Q6) Explain the following (any two)

- (a) Splay Tree and Trie
- (b) Graph Traversal Techniques
- (c) Huffman Encoding
- (d) Double Ended Queue (5 X 4 = 20 marks)