LAST MOMENT TUITIONS

Data Structures

DEC 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. What are various operations possible on data structures. (5 marks)
1.b. What are different ways of representing a Graph data structure on a computer. (5 marks)
1.c. Describe Tries with an example. (5 marks)
1.d. Write a function in C to implement binary search. (5 marks)

2.a. Use stack data structure to check well-formedness of parenthesis in an algebraic expression. Write C program for the same. (10 marks)
2.b Given the frequency for the following symbols, compute the Huffman code for each symbol.

Symbol	**A**	**B**	**C**	**D**	**E**
Frequency	24	12	10	8	8

(10 marks)

3.a. Write a C program to implement priority queue using arrays.
The program should perform the following operations:
i)Inserting in a priority queue.

ii)Deletion from a queue.

iii) Displaying contents of the queue. (12 marks)

3.b. What are expression trees? What are its advantages?
Derive the expression tree for the following algebraic expression :
(a + (b/c))*((d/e)-f) (8 marks)

4.a. Write a C program to represent and add two polynomials using linked list. (12 marks)
4.b. How does the Quicksort technique work? Give C function for the same. (8 marks)

5.a. What is doubly linked list? Give C representation for the same. (5 marks)
5.b. Given the postorder and inorder traversal of a binary tree,
construct the original tree:
POSTORDER : D E F B G L J K H C A

INORDER : D B F E A G C L J H K (10 marks)

5.c. What is hashing? What properties should a good hash function demonstrate? (5 marks)

6.a. Given an array int a [] = {69,78,63,98,67,75,66,90,81}.
Calculate address of a [5] if base address is 1600. (02 marks)
6.b. Give C function for Breadth First search Traversal of a graph.
Explain the code with an example. (12 marks)
6.c. Write a C program to implement a singly linked list.
The program should be able to perform the following operations.
i) Insert a node at the end of the list.

ii) Deleting a particular element.

iii) Display the linked list (08 marks)