

[07 - 2112]

II/IV B.Tech. DEGREE EXAMINATION.

First Semester

Computer Science and Engineering

DATA STRUCTURES

(Common with IT and M.S.S.E./IT)

(w.e.f. admitted batch of 2006-2007)

Time : Three hours

Maximum : 70 marks

First question is compulsory.

Answer any FOUR from the remaining questions.

All questions carry equal marks.

Answer all parts of any questions at one place.

1. Briefly answer the following questions :

- (a) How do you represent multidimensional arrays?
- (b) What is prefix notation? Explain with an example.
- (c) What is doubly linked list? How it is represented?
- (d) Explain implicit array representation of a binary tree.

(e) Write dictionary as an abstract data type.

(f) Explain the linked adjacency list representation of a graph.

(g) Define minimal spanning tree.

2. (a) Write a C program to implement stack operations.

(b) Write the prefix and postfix equivalents of the in fix expressions :

(i) $(A + B \uparrow D) / (E - F) + G$

(ii) $A * (B + D) / E - F * (G + H / K)$.

3. (a) What is recursive function? Define Ackerman's function $A(i, j)$. Use it to compute $A(1, 2)$, $A(2, 1)$ and $A(2, 2)$.

(b) Write ADT of a queue and explain different types of queues.

4. (a) Explain different ways of representing a binary tree.

(b) Define threaded binary tree explain its traversal.

5. (a) Write quick sort algorithm and apply it on the data 90, 77, 60, 99, 55, 88, 66.
- (b) Make heap tree from the data 44, 30, 50, 22, 60, 55, 77, 55 and use heap sort algorithm to sort the elements.
6. (a) Define binary search tree. Discuss insertion and deletion operations on binary search tree.
- (b) Write radix sort algorithm and explain it with suitable example.
7. (a) Explain transitive closure of a graph with an illustrative example.
- (b) Write shortest path algorithm and explain it with an example.
8. (a) Explain graph traversals with illustrative example.
- (b) Write Prim's algorithm and apply it on the graph.

