

## MCA (Revised)

## Term-End Examination

December, 2008

## MCS-021 : DATA AND FILE STRUCTURES

Time : 3 hours

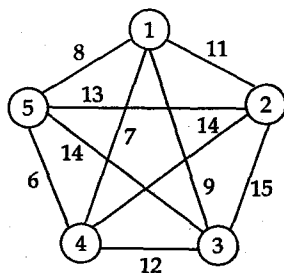
Maximum Marks : 100

(Weightage 75%)

**Note :** Question number 1 is compulsory. Attempt any three questions from the rest. All algorithms should be written nearer to 'C' language.

1. (a) Write algorithms for the following :
  - (i) To insert a node at a given position in a circular linked list. 5
  - (ii) To delete the first node from circular linked list. 5
- (b) Write an algorithm to create a Binary Tree. 10  
The algorithm should accept elements and display Binary Tree with those elements.
- (c) Write a program in 'C' language to implement Heap Sort. 10  
Also, apply heap sort algorithm to sort the following sequence in descending order :  
2, 3, 81, 64, 4, 25, 36, 16, 9, 49  
Show different steps of the heap during the process of sorting.

- (d) What is a linear queue ? Write an algorithm for adding an element to a linear queue. 10
2. (a) Write a 'C' program to implement priority queue using arrays, check for overflow and underflow conditions. 10
- (b) Write an algorithm to convert a given INFIX expression to PREFIX expression. Apply algorithm for the following expression :  $A*(B+C)$  10
3. (a) Construct a binary tree from the following traversals : 10  
 POSTORDER : J H D E B I F G C A  
 INORDER : D J H B E A F I C G
- (b) Define AVL tree. Write an algorithm for insertion of a node into AVL tree. 10
4. (a) Write an algorithm for the implementation of multiple stacks in an array. 10
- (b) Write PRIM'S algorithm to find Minimum Cost Spanning Tree. Draw the Minimum Cost Spanning Tree using Prim's Algorithm for the Graph given below : 10



5. (a) Write a program in 'C' for the implementation of a Doubly Linked List. 10
- (b) Explain sequential file organisation. What are various operations that can be performed on it ? Also, list any two disadvantages of it. 10

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