DATA STRUCTURE-I

Time : 3 Hours   **Maximum Marks : 90**

1. Short answer type :

   a) Differentiate between static and dynamic data structure with example.

   b) Explain time and space trade off of an algorithm.

   c) Evaluate the following post fix exp.

      A 582 + • 84 / + =

   d) A (a:10, 1:10) is a 10×10 array. Each element of the array is stored in two types of memory. If A [1] [1] begins at address 500.

      Compute the address of A [5] [6] when

      i)   The organisation is row major

      ii) The organisation is column major

   e) Consider the graph :
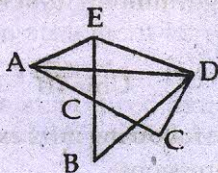
i) Find the degree of each mode

  ii) Adjancy matrix A of graph

  iii) Agjancy list of Graph

Unit-I

2. a) Differentiate between linear and non-linear data structure & with memory representation.

  b) Explain insertion and deletion operatio in a sequentially organised structure>

3. a) Write various string handling function available and their applications.

  b) Write an algorithm to locate a substring in a string.

Unit-II

4. a) How many data elements can be hold by an there arrays with dimension

    K (1:M), Y (-1 : M, 1 : N) and (-4:0, 2)

  b) A two dimensional array A with M rows and N colomns are given. Write an algorithm to transpose this array.

5. a) Differentiate between a single linked list and double linked list with respect to organisation?

  b) Write an algorithm tp count the number of nodes in a linked list.

Unit-III

6. a) Convert the following infix expression into prefix and postfix expressions:

! (a & ((b<c) !! (c>d))) !! (c<e)

b) A recursive procedure is defined by

$f(x) = 1$ if $x < 2$

$f(x-1) + f(x-2)$; otherwise

Write an algorith to implement the above procedure and compute the value of F (5).

7. a) Describe sequential and linked representation of a queue structure in memory.

b) Write PUSH and POP algorithm for a stack structure.

UNIT-IV

8. a) The order of modes of a binary tree in pveorder and in order traversal are as
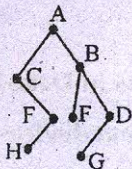
Preorder : A B C D F H J M K E G I L N

inorder : A D J M H K F C I N L G E B

Draw the corresponding binary tree

b) Write an algorithm to travers a binary tree in post order using a stack.

9. a) For the binary trees

Find :

i) Terminal

ii) Non terminal nodes

iii) Level of each node

b) Describe the internal memory representation of the

binary tree in the above figure (Part-A) as

i) A sequential representation

ii) A linked representation

iii) A threaded linked representation.

□□□