Roll No. ……

**979**

Printed Pages:

**BCA / D-12**
**DATA SRTUCTURE - I**
**Paper-BCA-232**

Time allowed: 3 hours Maximum marks: 80

**Note**: Attempt **five** questions in all, selecting **one** question from each section. **Question no. 1 is compulsory**.
All questions carry equal marks.

**1.** Short answer type :
(a) Differentiate between homogenous and non Homogenous data structure. 2
(b) Explain the measures for the efficiency of any algorithm. 3
(c) Define sparse matrices. 3
(d) Evaluate the following expression
E = 53+4*25-^ 4+ 4
(e) Explain adjacency matrix method to represent a graph. 4

**Unit-I**

**2.** (a) Define an algorithm. What are the properties of an algorithm. 8
(b) Write an algorithm to compute the product of two matrices A & B and store result in C. Find the complexity of this algorithm. 8
**3.** Explain the Brute Force algorithm for pattern matching. 16

**Unit-II**

**4.** (a) Describe the difference between sequential and linked storage allocation. 6
(b) Derive the formula to find the address of elements of two dimensional Arrays
(i) For row major order
(ii) For column major order. 10
**5.** Write the algorithm of a link list :
(i) deletion of a node
(ii) Insertion into sorted link list. 16

**Unit-III**

**6.** (a) Explain the difference between queue and circular queue. 8
(b) What do you mean by deque and priority queue? 8
**7.** (a) Describe the concept of polish notation. 8
(b) Convert the following enfix arithmetic expression into postfix expression
a + b * c ↑ d – (a/b + c) 8

## Unit-IV

**8.** (a) Explain the two ways to represent binary tree in memory. 10

(b) Draw a diagram of a binary tree T if the preorder and enorder traversal of T yield The following sequence of nodes

Enorder: E A C K F H D B G

Preorder: F A E K C D H G B 6

**9.** Explain the following:

(i) Graph
(ii) Order of graph
(iii) Complete graph
(iv) Directed graph
(v) Weighted graph
(vi) Size of graph
(vii) Degree of a node
(viii) Cycle graph 16