

Total No. of Questions : 12]

SEAT No. :

P4941

[Total No. of Pages : 2

[5672]-102

F.Y. M.C.A. (Engineering)

DATASTRUCTURES

(2019 Pattern) (Semester - I)

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) *Neat diagrams must be drawn wherever necessary.*
- 2) *Figures to the right side indicate full marks.*
- 3) *Assume suitable data if necessary.*

- Q1)** a) Explain linear and sequential organization of Data Structure. [6]
b) Given base address = 1000 and array m[4][3]. Calculate the address of m[1][2] by row major and column major representation. [5]

OR

- Q2)** a) Define Array. Explain the types of Array. [6]
b) Explain i) Atomic Data ii) Composite Data. [5]
- Q3)** a) Write a short note on Circular Linked List. [6]
b) Write a program to create a singly linked list and perform insert and display operations. [6]

OR

- Q4)** a) Explain the structure of node of Doubly Linked List. Write pseudo code to delete node from doubly linked list. [6]
b) Write a program to perform polynomial addition using Linked List. [6]
- Q5)** a) Explain variants of recursion- indirect, tail and tree. [6]
b) Convert the following infix expression to postfix and prefix [6]
i) $(A + B) * (C + D)$
ii) $A + (B * C - (D / E - F) * G) * H$

OR

P.T.O.

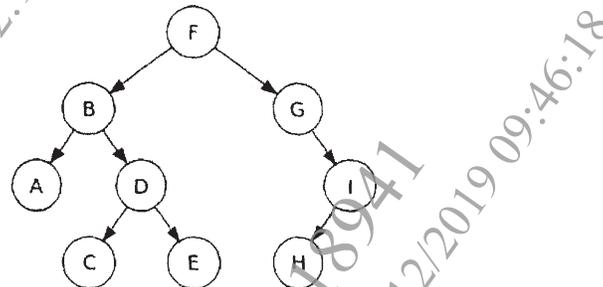
- Q6)** a) What is the condition for stack overflow and stack underflow? Enlist any 4 application of stack. [6]
 b) Write a short note on linked Stack. [6]

- Q7)** a) Write a program to create a queue and perform enqueue, dequeue and display operation. [6]
 b) Differentiate between priority queue and Circular Queue. [5]

OR

- Q8)** a) Explain the linked queue and its operation. [6]
 b) Enlist and explain the application of queue data structure. [5]

- Q9)** a) Write the post order, in order and preorder traversal of following tree. [6]



- b) What is the use of Adjacency Matrix and Adjacency List. [6]

OR

- Q10)** a) Explain the terms [6]
 i) Leaf node
 ii) Binary Search Tree
 iii) Spanning Tree
 b) Write a short note on BFS technique. [6]

- Q11)** a) Write a comparison study of any 4 sorting algorithms with respect to time and space complexity. [6]
 b) Write a program to implement insertion sort. [6]

OR

- Q12)** a) Write a program to implement Quick sort. [6]
 b) How binary search is better than sequential search explain with example. [6]

