Roll No. | | | | | | | | | | | | | Total No. of Pages : 02

Total No. of Questions : 09

MCA (2013 and 2019 Batch) (Sem.–2)

DATA STRUCTURES

Subject Code : MCA-203

M.Code : 26054

Time : 3 Hrs. Max. Marks : 100

INSTRUCTION TO CANDIDATES :

1. **SECTIONS-A, B, C & D contains TWO questions each carrying TWENTY marks each and students has to attempt any ONE question from each SECTION.**
2. **SECTION-E is COMPULSORY consisting of TEN questions carrying TWENTY marks in all.**

SECTION-A

1. Define and discuss the following:

   (a) Algorithmic complexity

   (b) Time and space trade-off

   (c) Big 0 notation

2. What are Stacks? What is the difference between a stack and a queue? Write a program to evaluate postfix expressions using a stack.

SECTION-B

3. What do you mean by a Binary tree? Explain the different binary tree traversals giving suitable examples.

4. Define the following :

   a) Binary tree ;

   b) AVL tree

   c) B- tree

   d) B+tree

SECTION-C

5. What is a Graph? What are the various types of graphs? Explain graph representation using adjacency matrix and adjacency lists.

6. Explain in detail the Dijkstra's algorithm for shortest path.

SECTION-D

7. Discuss the working of Quick Sort technique with an example. Also discuss its efficiency.

8. Discuss and differentiate between linear search and binary search techniques.

SECTION-E

9. Answer the following questions briefly :

a) Define Recursion.

b) What is garbage collection?

c) What is a circular queue? What are its applications?

d) What are priority queues?

e) Convert the following expression in postfix notation: (A+B) * ((C+B)/D – E)/F.

f) What is a circular linked list?

g) What is a Heap?

h) What is hashing? What is its use?

i) Differentiate between DFS and BFS.

j) Explain the working of Radix sort in brief.

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.