

**MSCCS-07/MSCCS-201/MCA-201**

June - Examination 2017

**MSCCS-Final/MCA-2nd Year Examination****Data Structure and Algorithm****Paper - MSCCS-07/MSCCS-201/MCA-201****Time : 3 Hours ]****[ Max. Marks :- 100**

**Note:** The question paper is divided into three sections A, B and C. Write answers as per given instructions.

**Section - A****10 × 2 = 20**

(Very Short Answer Questions)

**Note:** Answer **all** questions. As per the nature of the question delimit your answer in one word, one sentence or maximum upto 30 words. Each question carries 2 marks.

- 1) (i) Convert the expression  $(A + B)/(C - D)$  to Postfix form.
- (ii) Give the definition of Tree.
- (iii) Give an example of Linear Data Structure.
- (iv) List the applications of stack.
- (v) What do you mean by worst case complexity?
- (vi) Which algorithm is used to find all the pairs of shortest path in a graph?
- (vii) State Max-flow Min-cut Theorem.

- (viii) What is Planar Graph?
- (ix) When does the graph is isomorphic?
- (x) What do you mean by Hamiltonian Path of a graph?

### Section - B

**4 × 10 = 40**

(Short Answer Questions)

**Note:** Answer **any four** questions. Each answer should not exceed 200 words. Each question carries 10 marks.

- 2) Why stack is called a LIFO data structure? Describe the basic operations performed on a stack.
- 3) Consider the following circular queue capable of accommodating maximum six elements

Front = 2                  Rear = 4

Queue : \_\_, L, M, N, \_\_, \_\_

Where ‘\_\_’ denote empty memory cell.

Describe the queue as the following operation take place:

- (i) Add O
  - (ii) Add P
  - (iii) Delete two letters
  - (iv) Add Q, R, S
  - (v) Delete one letter
- 4) Write a function that remove all the duplicate elements from a Linked List.
  - 5) Compare Divide and Conquer and Dynamic method.
  - 6) What do you mean by sparse matrix? Explain different forms of sparse matrix.

- 7) State and Prove Cook's theorem.
- 8) What do you mean by asymptotic notations? Explain various asymptotic notations.
- 9) Write short note on AVL tree. Also explain how AVL tree differs from other tree data structure.

### Section - C

$2 \times 20 = 40$

(Long Answer Questions)

**Note:** Answer **any two** questions. You have to delimit your each answer maximum upto 500 words. Each question carries 20 marks.

- 10) What is an Array? Suppose an array  $a[15]$  stores numeric values, only write an algorithm for:
  - (i) Calculate average of the values in 'a'.
  - (ii) Print the even numbers stored in a.
- 11) What is the need for the dequeue? Write down the algorithms for insertion and deletion operations performed on the dequeue.
- 12) The following sequence gives the preorder and inorder of the Binary Tree 'T':

Preorder : A B D G C E H I F

Inorder: D G B A H E I C F

Draw the diagram of Tree.

- 13) What is Quick Sort? How does it differ from the Bubble Sort? Explain with an example.

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