

Roll No : .....

Total No. of Questions : 11 ]

[ Total No. of Printed Pages : 3

# MCL-772

M.Sc. (Lateral Entry) Examination, 2021

COMPUTER SCIENCE

Paper - MCSLE-103

(Data Structure)

Time : 1½ Hours ]

[ Maximum Marks : 50

## Section-A

(Marks : 2 × 10 = 20)

**Note :-** Answer all *ten* questions (Answer limit 50 words). Each question carries 2 marks.

(खण्ड-अ)

(अंक : 2 × 10 = 20)

**नोट :-** सभी दस प्रश्नों के उत्तर दीजिए (उत्तर-सीमा 50 शब्द)। प्रत्येक प्रश्न 2 अंक का है।

## Section-B

(Marks : 3 × 5 = 15)

**Note :-** Answer all *five* questions. Each question has internal choice (Answer limit 200 words). Each question carries 3 marks.

(खण्ड-ब)

(अंक : 3 × 5 = 15)

**नोट :-** सभी पाँच प्रश्नों के उत्तर दीजिए। प्रत्येक प्रश्न में विकल्प का चयन कीजिए (उत्तर-सीमा 200 शब्द)। प्रत्येक प्रश्न 3 अंक का है।

## Section-C

(Marks : 5 × 3 = 15)

**Note :-** Answer any *three* questions out of five (Answer limit 500 words). Each question carries 5 marks.

(खण्ड-स)

(अंक : 5 × 3 = 15)

**नोट :-** पाँच में से किन्हीं तीन प्रश्नों के उत्तर दीजिए (उत्तर-सीमा 500 शब्द)। प्रत्येक प्रश्न 5 अंक का है।

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**Section–A**

2 each

1. (i) Define the Linear Link List.
- (ii) Define the basic operations on linked list.
- (iii) What is Stack ?
- (iv) Define the Circular Queue.
- (v) What is AVL Tree ?
- (vi) Explain tree representation as an array.
- (vii) Define the Graph.
- (viii) What is degree in graph ?
- (ix) Define Bubble Sort.
- (x) Define String class.

**Section–B**

3 each

2. What are the criteria of algorithm analysis ? Explain with examples.

*Or*

Explain the advantages of linked list over array. Discuss the various types of linked list with suitable examples.

3. Explain the basic operations performed on stack given the algorithms also. 3

*Or*

Write notes on the following :

(a) Priority Queue

(b) D-Queue

$1\frac{1}{2}+1\frac{1}{2}=3$

4. What do you mean by Binary Tree ? Explain the basic terminology of binary tree.

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*Or*

What is Height Balance Tree ? Explain the insertion of 9 (nine) elements in height balance tree.

5. Explain the following :

(a) Directed and undirected graph

(b) Basic terminology of graph

$1\frac{1}{2}+1\frac{1}{2}=3$

*Or*

Explain memory representation of graph with suitable example.

3

6. What is Searching ? Write down the algorithm for binary search method.

*Or*

What is Sorting ? Why is there a need for sorting data elements ?

**Section-C**

5 each

7. What are the differences between singly linked list and doubly linked list ? Write a function to read a polynomial.

8. Write an algorithm to PUSH and POP an element from stack. Explain stack application with INFIX, POSTFIX and PREFIX Operations.

9. What is a Tree ? Write algorithm to create a binary tree using array representation.

10. Explain Depth First Search and Breadth First Search in detail.

11. Explain any *two* of the following :

(a) Quick Sort

(b) Bubble Sort

(c) Heap Sort

$2\frac{1}{2}+2\frac{1}{2}=5$