Day: Thursday   Time: 2:00 P.M. TO 4:30 P.M.
Date: 09.06 2022   Max. Marks: 100
                       S-10093-2022

N.B.:

1) Attempt any **FOUR** questions from Section –I and any **TWO** questions from Section –II.
2) Figures to the right indicate **FULL** marks.
3) Answers to both the sections should be written in **SAME** answer book.

SECTION-I

Q.1 **a)** What is an Array? List the properties of array. **(07)**

b) What is Abstract Data Type? How an Abstract Data Type is implemented in language? **(08)**

Q.2 **a)** Differentiate between built-in data structure and user defined data structure. **(07)**

b) What is the role of pre-condition and post-condition in implementing a data structure? **(08)**

Q.3 Explain the algorithm to implement STACK with the help of array. **(15)**

Q.4 Write prefix notation of following expression using stack: **(15)**
$A + (B * C - (D / E \wedge F) * G) * H$

Q.5 What is binary search tree? Explain binary tree traversal algorithms. **(15)**

Q.6 What are AVL trees? How AVL tree improves the efficiency of search? **(15)**

Q.7 Write short notes on any **THREE** of the following: **(15)**
   a) Infix expression
   b) Dequeue
   c) Merge sort
   d) Red- Black tree

SECTION-II

Q.8 What is linear data structure? Write algorithms to perform following operations on a linked list: insertion, deletion, traversing. **(20)**

Q.9 What is Queue data structure? Explain implementation of Queue with the help of array. **(20)**

Q.10 What is binary heap? Explain various operations on binary heap. Explain heap sort algorithm. **(20)**

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