

Day: **Tuesday**  
Date: **16-4-2019**

Time: **10:00 A.M. TO 1:00 P.M.**  
Max. Marks: 100

**S. 2019-2174**

**N.B.**

- 1) Attempt any **FOUR** questions from Section -I
- 2) Attempt any **TWO** questions from Section - II
- 3) Figures to the right indicate **FULL** marks.
- 4) Solve both sections in **SAME** answer sheet

**SECTION-I**

- Q.1** Define data structure. Compare built in data types with user defined data types. (15)
- Q.2** What is link list? What are advantages of using link list against array data structure? (15)
- Q.3** What is dequeue? Write an algorithm to insert an element in dequeue. (15)
- Q.4** Explain breadth first traversal algorithm for trees with example. (15)
- Q.5** Write an algorithm to implement Quick sort algorithm. (15)
- Q.6** Write short notes on any **THREE** of the following: (15)
- a) Hash table
  - b) Binary search
  - c) Built-in data types
  - d) Red-Black trees

**SECTION-II**

- Q.7** What are AVL trees? Explain different types of rotations used in AVL tree. (20)
- Q.8** Write an algorithm for merge sort. Sort the following list using merge sort: (20)  
3, 93, 4, 0, 89, 300, 85
- Q.9** What is binary heap? How binary heap is stored in an array? Explain various operation on heaps. (20)

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