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SEAT No. :

PA-1010

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[5902]-31

S.Y.B.Sc. (Computer Science)

CS 231 : DATA STRUCTURES AND ALGORITHMS - I

(2019 CBCS Pattern) (Semester - III) (23121)

Time : 2 Hours]

[Max. Marks : 35

Instructions to the candidates:

- 1) *All questions are compulsory*
- 2) *Figures to the right indicate full marks.*
- 3) *Neat diagrams must be drawn wherever necessary.*
- 3) *Your answers will be values as a whole.*

Q1) Attempt any Eight of the following.

[8×1=8]

- a) Define Data Object.
- b) Define stable sorting.
- c) List Linear search variations.
- d) What is time complexity of merge sort?
- e) Define the term null list.
- f) Write any two applications of linked list.
- g) Write node structure of doubly linked list.
- h) What is Top of the stack?
- i) Define Recursion.
- j) What is circular queue?

Q2) Attempt any Four of the following.

[4×2=8]

- a) Describe the term ADT.
- b) What is the best case and worst case efficiency of quick sort?
- c) What is divide and conquer strategy?
- d) Justify true or false: "A linked list can only be traversed sequentially".
- e) Define the following terms.
 - i) Stack overflow.
 - ii) Stack underflow.

P.T.O.

Q3) Attempt any TWO of the following. **[2×4=8]**

- a) Write a program to search an element using linear search algorithm.
- b) Write a C function to reverse a string using stack.
- c) Write a C function to delete a node from singly circular linked list at any position.

Q4) Attempt any TWO of the following. **[2×4=8]**

- a) Sort the following elements using bubble sort algorithm.
89 29 39 79 59 49 69 19
- b) Convert the following infix expression into postfix expression.
 $P * Q + R / S - T$
- c) Define Deque. List types of Deque and explain any two operations performed on Deque.

Q5) Attempt any ONE of the following. **[1×3=3]**

- a) Define the following terms.
 - i) Data Structure.
 - ii) Omega Notation.
 - iii) Time Complexity.
- b) Write a short note on priority queue.

