Total No. of Questions : 5] SEAT No. :

**PE1499** [Total No. of Pages : 2

# [6502]-301

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

## CS - 231 : DATA STRUCTURES AND ALGORITHMS - I

## ( Revised 2019 Pattern) (Semester - III) (Paper - I) (23121)

*Time : 2Hours]* *[Max. Marks : 35*

***Instructions to the candidates:***

1) ***All questions are compulsory.***
2) ***Figures to the right indicates full marks.***

***Q1)*** Attempt any 8 of the following. **[8×1=8]**

a) Define space complexity.

b) What is Big Oh (O)?

c) Binary search is faster than linear search-state True/False.

d) What is the time complexity of Quick sort?

e) Define linked list.

f) Write any two applications of linked list.

g) What is recursion?

h) Write postfix expression for given infix expression (*x*+*y*) *Z

i) “Queue follows FIFO order” state True/ False.

j) What is queue?

***Q2)*** Attempt any 4 of the following. **[4×2=8]**

a) What is stack underflow and stack overflow.

b) Differentiate between linear queue and circular queue.

c) What is linear search? List linear search variations.

d) Define data structure and List any two types of it.

e) Write node structure of doubly linked list.

f) List 3 asymptotic notations along with their usage.

***P.T.O.***

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***Q3)*** Attempt any two of the following : **[2×4=8]**

a) Write 'C' function for implementing Linear search algorithm.

b) Write a 'C' function to create doubly linked list.

c) Write functions definition in 'C' for push () and pop () to implement static stack.

***Q4)*** Attempt any two of the following : **[2×4=8]**

a) Explain static implementation of queue.

b) Sort the following elements using merge sort. 38, 27, 43, 3, 82, 9

c) Evaluate the following postfix expression using stack: PQ-RS*/ given P=2, Q=10, R=4 and S=1.

***Q5)*** Attempt any one of the following : **[1×3=3]**

a) What is generalized linked list? Represent the given List (a,(b,c),d)

b) Show the contents of queue at each step of the following statements:

i) addQ(P)

ii) addQ(Q)

iii) removeQ()

iv) addQ(R)

v) removeQ()

vi) addQ(S)

vii) addQ(T)

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