Total No. of Questions : 5]

P-6376

SEAT No. : ☐

[Total No. of Pages : 2

[6155]-31
S.Y. B.Sc. (Computer Science)
CS-231 : DATA STRUCTURES AND ALGORITHMS - I
(Rev.2019) (Semester-III) (23121)

Time : 2 Hours]

[Max. Marks : 35

Instructions to the candidates :
1) Figures to the right indicate full marks.
2) Neat diagrams must be drawn wherever necessary.

Q1) Attempt any EIGHT of the following: [8 × 1 = 8]

a) 'Q' notation is used to denote upper of the time complexity, state true/False.

b) Define Data structure.

c) What is In-place sorting?

d) State the time complexity of merge sort?

e) Write structure definition for singly circular linked list.

f) Write postfix expression for a given infix expression. ((((P+Q)/R)*L)*M)

g) "Doubly linked list need more merely than singly linked List" state true/false.

h) What is priarity queue?

i) Wha is Double ended Queue?

j) Define stack.

Q2) Attempt any FOUR of the following : [4 × 2 = 8]

a) List different types of data structures.

b) What is time complexity?

c) Explain Divide and Conquer strategy.

d) Write representation of polynomial using linked list with suitable example.

e) List applications of stack.

f) Differentiate between circular queue & linear queue

P.T.O.

Q3) **Attempt any TWO of the following :** [2 × 4 = 8]
   a) Write a recussive function in 'C' for binary search.
   b) Write a function in 'C' to delete a node from singly linked list by value.
   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) Apply selection sort to the following data:
      98, 22, 79, 36, 47, 26, 82
   b) Write a function in 'C' to implement insert operation of a dynamic queue.
   c) Evaluate following postfix expression show all steps
      A/B/C+D*E
      Assume A=16, B=2, C=4, D=1, E=2

Q5) **Attempt any ONE of the following :** [1 × 3 = 3]
   a) What is generalized linked List? Represent the given List (a,(b,c,d),e,f).
   b) Show the contents of queue at each step of the following program statements:

   int $x = 20$, $y = 30$;
   init ();
   enqueue (6);
   enqueue (x)
   y = dequeue ();
   y = dequeue ();
   enqueue (y+3);
   x = y+30
   enqueue (x);
   enqueue (x–1);
   enqueue (x);

ОООО