

3/12/2019 (M)

27

[This question paper contains 7 printed pages]

Your Roll No. :

Sl. No. of Q. Paper : **7403** **J**

Unique Paper Code : 32341301

Name of the Course : **B.Sc.(Hons.) Computer Science**

Name of the Paper : **Data Structures**

Semester : **III**

Time : 3 Hours **Maximum Marks : 75**

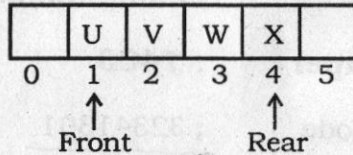
Instructions for Candidates :

- (a) Write your Roll No. on the top immediately on receipt of this question paper.
- (b) Question No. 1 is compulsory.
- (c) Attempt any **four** questions out of the remaining Question No. 2 to 7.
- (d) Parts of a question must be answered together.

1. (a) Convert the following infix expression to postfix form using a stack : 5
 $(A - B / C) * (D * E - F)$
Show the contents of the stack at every step.

P.T.O.

- (b) Consider the following Queue of characters of size 6 : 5



This Queue is implemented as a circular array. Show the contents of the Queue with the positions of Front and Rear after each of the following operations :

(i) Y is added to the Queue

(ii) One element is deleted

(iii) Z, A and B are added

(iv) Three elements are deleted

(v) C is added

- (c) Given a single linked list of characters, write a function to check whether this list is a palindrome or not. You may use any one additional data structure. 5

- (b) A Tridiagonal matrix T of dimension $n \times n$ that has all non-zero entries on the three central diagonals is mapped to a one-dimensional array D by diagonals, starting with the lowest diagonal. Obtain the formula for the location of an element $T(i, j)$ in D . 4

7. (a) Given a doubly linked list, write an algorithm to swap the k th node from the beginning of this list with the k th node from the end of the same list. The nodes have to be swapped and not their contents. 6
- (b) Write a recursive function to find the sum of the elements of an array. 4