

B.C.A. (Part-II) Semester-III Examination**DATA STRUCTURE****Paper – 3 ST 1**

Time : Three Hours]

[Maximum Marks : 60

N.B. :- (1) **ALL** questions carry equal marks.

(2) Assume suitable data wherever necessary.

(3) Draw neat sketches if required.

1. (a) Explain different data structure operations with example. 6
- (b) What is Array ? Explain the algorithm to delete an element from given array with suitable example. 6

OR

2. (a) Explain the infix, postfix, prefix notation with example. 3
- (b) Convert the following infix expressions into postfix form :
 - (i) $(A + B) * (C - D)$
 - (ii) $A/B * C - D + E/F / (G + H)$
 - (iii) $(A + B) * C - (D - E) / (F + G)$ 3
- (c) Consider the following stack of characters, where stack is allocated $N = 7$ memory cells
STACK : DATA

Describe the stack as the following operations take place.

(i) PUSH S

(ii) PUSH T

(iii) PUSH R

(iv) POP ITEM

(v) POP ITEM

(vi) PUSH Q 6

3. (a) Write a procedure for Tower of Hanoi using recursion. 6
- (b) Explain the translation of prefix to postfix using recursion. 6

OR

4. (a) Write an algorithm to add to or delete element from a queue. 6
- (b) Write an algorithm to obtain factorial of given number using recursion. 6
5. (a) Explain the types of queue in detail. 6
- (b) Explain linked list with its advantages and disadvantages. 6

OR

6. (a) Explain linked representation of Binary Tree. 6
- (b) Explain the procedure for post order traversal with an example. 6
7. (a) Explain the procedure for addition of element in binary tree with diagram. 6
- (b) Consider algebraic equation
 $E = (2x + y) (5a - b)^2$. Draw a tree prefix expression equivalent to E. 6

OR

8. (a) Write a Bubble Sort Algorithm and explain with example. 6
- (b) Explain selection sort algorithm with example. 6
9. (a) State and explain Quick sort with its example. 6
- (b) Explain the Radix sort with its example. 6

OR

10. (a) Write Binary search algorithm, explain with example. 6
- (b) What is Hashing ? Explain the different methods of Hashing. 6