

**B.C.A. (Part—II) Semester—III Examination****3ST1 : DATA STRUCTURE**

Time : Three Hours]

[Maximum Marks : 60

**Note :—**(1) All questions carry equal marks.

(2) All questions are compulsory.

1. (a) What is Data Structure ? Explain the types of Data Structure with suitable example. 6
- (b) What is Stack ? Explain how overflow and underflow condition occurs in stack with example. 6

**OR**

2. (a) Consider the following stack of characters where STACK is allocated  $N = 8$  memory cells :

STACK → 

A	C	D	E	F			
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Describe the stack as following operations take place :

- (i) PUSH (STACK, G)
  - (ii) PUSH (STACK, H)
  - (iii) PUSH (STACK, I)
  - (iv) POP (STACK, ITEM)
  - (v) POP (STACK, ITEM)
  - (vi) PUSH (STACK, P) 6
- (b) What is array ? Explain the algorithm to traversing an array with suitable example. 6
3. (a) Explain the recursive definition using multiplication of Natural Numbers. 6
  - (b) What is Recursion ? Explain the types of Recursion with suitable example. 6

**OR**

4. (a) Explain the Tower of Hanoi problem with example. 6
  - (b) Explain the recursion algorithm to find the factorial of given numbers. 6
5. (a) What is linked list ? Explain the advantages and disadvantages of linked list. 6
  - (b) Write and explain the algorithm to delete an element from Queue with suitable example. 6

**OR**

6. (a) Explain the different types of Queue. **www.FirstRanker.com** **www.FirstRanker.com** 6  
(b) Explain the algorithm to traverse a linear linked list with suitable example. 6
7. What is Tree ? Explain the families of Tree with suitable example. 12

OR

8. Explain the types of Tree Traversing with suitable example. 12
9. (a) What is sorting ? Explain the bubble sort algorithm with suitable example. 6  
(b) Explain the Binary Search Algorithm with suitable example. 6

OR

10. (a) What is Searching ? Explain the algorithm to search the element using Linear Search Method. 6  
(b) Explain the algorithm to sort the element using selection sort method with suitable example. 6