Chandigarh College of Engineering and Technology, (Degree Wing) Chandigarh
Department of Computer Science and Engineering
CS-301: Data Structures Assignment: 06 Date: 27.08.2024

S. No.	**Note:** Start answer of a fresh question from fresh page only. Direct answer to a question will not be entertained.	course outcome (CO)
1.	Write answer in brief? Wherever possible use suitable example in support of your answer. (a) The value of 15 5 / 13 21 *+ is _____. (b) The prefix form of A ^ B * C - D + E/ F/ (G + H) is_____	CO1
2.	Implement the following algorithm using data structure Array in C/C++ for the stack. In the following **Traverse** and **Peek** algorithms original stack is **S** and **SIZE** is Its size/capacity. The **Info** is used to POP/get and PUSH the content of the stack. **PInfo** peeked item/information which is being used to receive from the user.	CO4

```
Traverse(S, TOS)
{
    1. [Initialization]
       BS[SIZE]: Back Stack of size S
       TOSB←0: Top of the stack BS
       Flag←0 [Initialize flag]
    2. [Check/Get the return information from POP]
       Info ←POP(S, TOS)
       If (Info=0) {
                Output “Underflow”
                Flag←1
                Break
       } Else{  [Restore/Backup the Popped item/information/element]
                TOSB ←TOSB+1
                BS[TOSB] ←Info
                TOS ←TOS-1
       }
    3. [Iterate]
       Repeat Thru Step 2

    4. [Reconstruct the Original Stack]
       If (Flag=1 and TOSB≠0)
       {
                Info ←POP(BS, TOSB)
                PUSH(S, TOS, SIZE, Info)
       }
    5. [Check the status of BS]

                If (TOSB=0)
                        Return
```

```
                Else
                        Repeat Thru Step 4
    6. [END]
       Return

PEEK(S, TOS, PInfo)
{
    1. [Initialization]
       BS[SIZE]: Back Stack of size S
       TOSB←0: Top of the stack BS
       Flag←0 [Initialize flag]
    2. [Check/Get the returned information from POP algorithm]
       Info ←POP(S, TOS)
       If (Info=0) {
                Output "Underflow"
                Flag←1
                Break
       } Else if (Info ≠PInfo){  [Restore/Backup the Popped
       item/information/element]
                TOSB ←TOSB+1
                BS[TOSB] ←Info
                TOS ←TOS-1
       }Else{
                Flag ←1
                Go to Step 4
       }
    3. [Iterate]
       Repeat Thru Step 2
    4. [Reconstruct the Original Stack]
       If (Flag=1 and TOSB≠0){
                Info ←POP(BS, TOSB)
                PUSH(S,TOS, SIZE, Info)
       }
    5. [Check the status of BS]
                If (TOSB=0)
                        Return
                Else
                        Repeat Thru Step 4
    6. [END]
       Return
```

3. Suppose the following **Stack** of names is in memory, where **Stack** is allocated **n = 10** rooms: CO1

   TOP = 7

   Stack: DON, RACHITA, MISTHI, TOM ALTER, NAFIZ, JEF, DONO MANN, _____, _____, _____.

   Find output of the following codes:

   (a) pop(Stack, Name1)
   pop(Stack, Name2)
   push(Stack, Name3)

(a) Do while (TOP ≠ 0)
pop (Stack, Name)
[End of loop]