



INDIAN SCHOOL DARSAIT DEPARTMENT OF ICT



Subject: Computer Science

Topic: Stack and Queue

Worksheet No. : 12

Resource Person: Roilet Noronha

Date: _____

Name of the Student : _____

Class & Div: XII ____

Roll Number : ____

1. Write the definition of a member function INSERT() and DEL() for a class QUEUE in C++, to insert an ITEM in a dynamically allocated Queue of items considering the following code is already written as a part of the program.

```
struct ITEM
{
int INO; char INAME[20];
ITEM *Link;
};
class QUEUE
{
ITEM *R,*F;
public :
QUEUE() {R=NULL;F=NULL;}
void INSERT();
void DELETE();
~QUEUE();
};
```

2. Write the definition of a member function Push() and Pop() in C++, to delete a book from a dynamic stack of TEXTBOOKS considering the following code is already included in the program.

```
struct TEXTBOOKS
{
char ISBN[20]; char TITLE[80];
TEXTBOOKS *Link;
};
class STACK
{
TEXTBOOKS *Top;
public:
STACK(){Top=NULL;}
void Push();
void Pop();
~STACK();
};
```

3. Each node of a STACK contains the following information, in addition to the required pointer field :
- a. acc_no
 - b. acc_name
- Give the structure of node for the linked stack in question. TOP is a pointer which points to the topmost node of the STACK. Write the following functions.
- i) PUSH() – To push a node to the STACK which is allocated dynamically.
 - ii) POP() – To remove a node from the STACK and release the memory.

4. Write a function in C++ to Perform insert operation on a dynamically allocated Queue containing Passenger details as given in the following definition of NODE.
- ```

struct NODE
{
long Pno; //passenger number
char Pname[20]; //passenger name
NODE *Link;
};

```
5. Convert the following Infix expression to its equivalent Postfix and Prefix expression, showing the stack contents for each step of conversion.
- $A/(B+C)*D-E$
  - $X / Y + U * (V-W)$
  - $X - Y / (Z + U) * V$
  - $X - ( Y + Z ) / U * V$
  - $P + ( Q - R ) * S / T$
6. Convert the following Postfix expression to its equivalent infix expression, showing the stack contents for each step of conversion.
- $A B C * + D +$
  - $PQ+MN-/AB*-$
  - $A B * (C D /) +$
7. Convert the following Prefix expression to its equivalent infix expression, showing the stack contents for each step of conversion.
- $++ A * B C D$
  - $*+PQ-MN$
  - $+*+A^BCD^E5$
8. Evaluate the following POSTFIX notation and show stack status after every step of evaluation:
- T,F,NOT,AND,F,T,OR,AND
  - 60,6,/,5,2,\*,5,-,+
  - 50, 60, +,20, 10, -, \*
  - False, True, NOT, OR, True, False, AND, OR
  - 20,30,+,50,40,-,\*
  - 23-4+567\*+\*
  - 470,5, 4, ^,25, /, 6,\*