LAB PROGRAM 1: Write a program to simulate the working of stack using an array with the following:
a) Push b) Pop c) Display.
The program should print appropriate messages for stack overflow, stack underflow.

```
#include<stdio.h>
#include<process.h>
#include<conio.h>
#define STACK_SIZE 5
int top=-1;
int s[10];
int item;
void push()
{
if(top==STACK_SIZE-1)
{
printf("Stack overflow\n");
return;
}
top=top+1;
s[top]=item; printf("Item has been inserted\n");
}
int pop()
{
if(top==-1) return -1;
return s[top--];
}
void display()
{
int i;
if(top==-1) {
```

```
printf("stack is empty \n");
return ;
}
printf ("Contents of the stack:\n");
for (i=0;i<=top ; i++)
{
printf ("%d \n", s[i]);
}}
void main()
{
int item_deleted ;
int choice ;
clrscr();
for(;;)
{
printf ("\n 1. PUSH\n 2: POP \n 3: DISPLAY \n 4:EXIT\n");
printf ("Enter your choice \n");
scanf ("%d", &choice);
switch (choice)
{
case 1: printf("Enter the item to be inserted \n");
scanf("%d", &item );
push();
printf(" item has been inserted \n");
break;
case 2: item_deleted=pop();
if (item_deleted==-1)
printf ("Stack is empty \n");
```

```
        else printf("Item deleted is %d\n", item_deleted);
             break;
case 3 : display();
             break;
default : printf("Invalid choice\n");
    }
  }
}
```

OUTPUT:

```
1. PUSH
2. POP
3. DISPLAY
Enter your choice
1
Enter the item to be inserted
4
Item has been inserted

1. PUSH
2. POP
3. DISPLAY
Enter your choice
1
Enter the item to be inserted
6
Item has been inserted
1. PUSH
2. POP
3. DISPLAY
Enter your choice
```

1
Enter the item to be inserted
98
Item has been inserted
1. PUSH
2. POP
3. DISPLAY
Enter your choice
1
Enter the item to be inserted
33
Item has been inserted
1. PUSH
2. POP
3. DISPLAY
Enter your choice
1.
Enter the item to be inserted
45
Item has been inserted
1. PUSH
2. POP
3. DISPLAY
Enter your choice
1
Enter item to be inserted
2
Stack overflow
1. PUSH
2. POP
3. DISPLAY
Enter your choice

3
Contents of the stack are:
4
6
98
33
45

1. PUSH
2. POP
3. DISPLAY
Enter your choice
2
Item deleted is 45
1. PUSH
2. POP
3. DISPLAY
Enter your choice
2
Item deleted is 33
1. PUSH
2. POP
3. DISPLAY
Enter your choice
2
Item deleted is 98
1. PUSH
2. POP
3. DISPLAY
Enter your choice
2
Item deleted is 6
1. PUSH
2. POP
3. DISPLAY
Enter your choice
2
Item deleted is 4
1. PUSH
2. POP
3. DISPLAY
Enter your choice
4
Stack is empty
1. PUSH
2. POP
3. DISPLAY
Enter your choice.

```
 1. PUSH
 2. POP
 3. DISPLAY
 Enter your choice
1
Enter the item to be inserted
4
Item has been inserted

 1. PUSH
 2. POP
 3. DISPLAY
 Enter your choice
1
Enter the item to be inserted
6
Item has been inserted

 1. PUSH
 2. POP
 3. DISPLAY
 Enter your choice
1
Enter the item to be inserted
98
Item has been inserted

 1. PUSH
 2. POP
 3. DISPLAY
 Enter your choice
1
Enter the item to be inserted
```

```
33
Item has been inserted

 1. PUSH
 2. POP
 3. DISPLAY
 Enter your choice
1
Enter the item to be inserted
45
Item has been inserted

 1. PUSH
 2. POP
 3. DISPLAY
 Enter your choice
1
Enter the item to be inserted
2
Stack overflow
Item has been inserted

 1. PUSH
 2. POP
 3. DISPLAY
 Enter your choice
3
Contents of the stack are:
4
6
98
33
45
```

```
1. PUSH
2. POP
3. DISPLAY
Enter your choice
2
Item deleted is 98

1. PUSH
2. POP
3. DISPLAY
Enter your choice
2
Item deleted is 6

1. PUSH
2. POP
3. DISPLAY
Enter your choice
2
Item deleted is 4

1. PUSH
2. POP
3. DISPLAY
Enter your choice
2
Stack is empty

1. PUSH
2. POP
3. DISPLAY
Enter your choice
```

```
 1. PUSH
 2. POP
 3. DISPLAY
 Enter your choice
1
Enter the item to be inserted
4
Item has been inserted

 1. PUSH
 2. POP
 3. DISPLAY
 Enter your choice
1
Enter the item to be inserted
6
Item has been inserted

 1. PUSH
 2. POP
 3. DISPLAY
 Enter your choice
1
Enter the item to be inserted
98
Item has been inserted

 1. PUSH
 2. POP
 3. DISPLAY
 Enter your choice
1
Enter the item to be inserted
```