**WAP to simulate the working of a circular queue of integers using an array. Provide the following operations.**
**a) Insert**
**b) Delete**
**c) Display**
**The program should print appropriate messages for queue empty and queue overflow conditions**

**CODE:**

```
#include<stdio.h>
#include<stdlib.h>
#define QUE_SIZE 3
int item,front=0,rear=-1,q[QUE_SIZE],count=0;
void insertrear()
{
if(count==QUE_SIZE)
{
printf("queue overflow\n");
return;
}
rear=(rear+1)%QUE_SIZE;
q[rear]=item;
count++;
}
int deletefront()
{
if(count==0) return -1;
item=q[front];
front=(front+1)%QUE_SIZE;
count=count-1;
return item;
}
void displayQ()
{
int i,f;
if(count==0)
{
printf("queue is empty\n");
return;
}
f=front;
printf("Contents of queue \n");
for(i=1;i<=count;i++)
{
printf("%d\n",q[f]);
f=(f+1)%QUE_SIZE;
}
```

```
}
void main()
{
 int choice;

 for(;;)
 {
 printf("\n1:insertrear\n2:deletefront\n3:display\n4:exit\n");
 printf("enter the choice\n");
 scanf("%d",&choice);

 switch(choice)
 {
 case 1:printf("enter the item to be inserted\n");
            scanf("%d",&item);
            insertrear();
            break;
 case 2:item=deletefront();
            if(item==-1)
            printf("queue is empty\n");
            else
            printf("item deleted =%d\n",item);
            break;
 case 3:displayQ();
            break;
 case 4:exit(0);
 break;
 default:printf("Invalid choice\n");
}
}
}
```

**OUTPUT:**

**Case 1:Inserting elements and displaying them**

```
1:insertrear
2:deletefront
3:display
4:exit
enter the choice
1
enter the item to be inserted
1

1:insertrear
2:deletefront
3:display
4:exit
enter the choice
1
enter the item to be inserted
2

1:insertrear
2:deletefront
3:display
4:exit
enter the choice
1
enter the item to be inserted
3

1:insertrear
2:deletefront
3:display
4:exit
enter the choice
3
Contents of queue
1
2
3
```

**Case 2:Deleting elements and inserting again, then displaying them**

```
1:insertrear
2:deletefront
3:display
4:exit
enter the choice
2
item deleted =1

1:insertrear
2:deletefront
3:display
4:exit
enter the choice
1
enter the item to be inserted
4

1:insertrear
2:deletefront
3:display
4:exit
enter the choice
3
Contents of queue
2
3
4
```

**Case 3:Queue overflow condition**

```
1:insertrear
2:deletefront
3:display
4:exit
enter the choice
1
enter the item to be inserted
6
queue overflow
```

**Case 4:Deleting all the elements and Queue empty condition**

```
1:insertrear
2:deletefront
3:display
4:exit
enter the choice
2
item deleted =2

1:insertrear
2:deletefront
3:display
4:exit
enter the choice
2
item deleted =3

1:insertrear
2:deletefront
3:display
4:exit
enter the choice
2
item deleted =4

1:insertrear
2:deletefront
3:display
4:exit
enter the choice
2
queue is empty
```

**Case 5:Invalid choice and exit options**

```
1:insertrear
2:deletefront
3:display
4:exit
enter the choice
7
Invalid choice

1:insertrear
2:deletefront
3:display
4:exit
enter the choice
4

Process returned 0 (0x0)   execution time : 62.201 s
Press any key to continue.
```