DS—LAB PROGRAMS

QUESTION-1

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<conio.h>

#include<stdlib.h>


#define QUE_SIZE 5

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;
}
}
int 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;
```

```
 default:exit(0);

}

}



}
```

```
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
2
item deleted =1

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

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

```
3:display
4:exit
enter the choice
1
enter the item to be inserted
5

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

1:insertrear
2:deletefront
3:display
4:exit
enter the choice
3
Contents of queue
5
6

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

```
3:display
4:exit
enter the choice
1
enter the item to be inserted
10

1:insertrear
2:deletefront
3:display
4:exit
enter the choice
1
enter the item to be inserted
7

1:insertrear
2:deletefront
3:display
4:exit
enter the choice
1
enter the item to be inserted
9

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

```
3:display
4:exit
enter the choice
1
enter the item to be inserted
7

1:insertrear
2:deletefront
3:display
4:exit
enter the choice
1
enter the item to be inserted
9

1:insertrear
2:deletefront
3:display
4:exit
enter the choice
1
enter the item to be inserted
8
queue overflow

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