

PROGRAM 4

Write a program 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 -

```
#include <stdio.h>
#include <stdlib.h>

int front = -1, rear = -1;

int main()
{
    int ch;
    int item, MAX, i;
    printf("Enter the size of queue: ");
    scanf("%d", &MAX);
    int queue[MAX];
    do
    {
        printf("\n1. Insert\n2. Delete\n3. Display\n4.
Exit");
        printf("\nEnter your choice: ");
        scanf("%d", &ch);
        switch (ch)
        {
            case 1:
                if (front == (rear + 1) % MAX)
```

```
        printf("Queue is full\n");
else
{
    printf("Enter the element: ");
    scanf("%d", &item);
    rear = (rear + 1) % MAX;
    queue[rear] = item;
    if (front == -1)
        front = 0;
}
break;
```

case 2:

```
if (front == -1 && rear == -1)
    printf("Queue is empty\n");
else
{
    item = queue[front];
    if (front == rear)
    {
        front = -1;
        rear = -1;
    }
    else
        front = (front + 1) % MAX;
    printf("Removed element is %d \n", item);
}
break;
```

case 3:

```
printf("Queue contents are: ");  
for (i = front; i != rear; i = (i + 1) % MAX)  
    printf(" %d ", queue[i]);  
printf(" %d ", queue[i]);  
printf("\n");  
break;
```

case 4:

```
    exit(0);  
}  
} while (ch != 4);  
return 0;  
}
```

Output -

```
Enter the size of queue: 5  
  
1. Insert  
2. Delete  
3. Display  
4. Exit  
Enter your choice: 1  
Enter the element: 12  
  
1. Insert  
2. Delete  
3. Display  
4. Exit  
Enter your choice: 1  
Enter the element: 14  
  
1. Insert  
2. Delete  
3. Display  
4. Exit  
Enter your choice: 1  
Enter the element: 16  
  
1. Insert  
2. Delete  
3. Display  
4. Exit  
Enter your choice: 1  
Enter the element: 18  
  
1. Insert  
2. Delete  
3. Display  
4. Exit  
Enter your choice: 1  
Enter the element: 20
```

```
1. Insert
2. Delete
3. Display
4. Exit
Enter your choice: 3
Queue contents are: 12 14 16 18 20

1. Insert
2. Delete
3. Display
4. Exit
Enter your choice: 2
Removed element is 12

1. Insert
2. Delete
3. Display
4. Exit
Enter your choice: 3
Queue contents are: 14 16 18 20

1. Insert
2. Delete
3. Display
4. Exit
Enter your choice: 4

...Program finished with exit code 0
Press ENTER to exit console.
```