SLIIT
Discover Your Future

BSc (Hons) in Information Technology

Year 2

Data Structures and Algorithms – IT2070

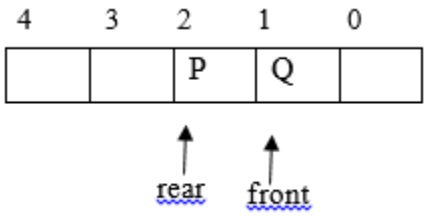
Worksheet 2 – Queues

2024

Question 1

a) Write one advantage of having a circular queue instead of a linear queue

b) Consider the following Circular Queue and draw the queue frames after executing each statement given below.



i) insert('R')
ii) peekFront()
iii) insert('S')
iv) insert('T')
v) remove()

c) What will happen if the above queue is a linear queue?

Question 2

a) How do you find whether a linear queue is full?
b) How do you find whether a circular queue is full?
c) How do you find whether a linear queue is empty?
d) How do you find whether a circular queue is empty?

Question 3

i) Implement isEmpty() and isFull() methods of the circular queue class.

ii) Assume that a circular queue class has already been implemented with insert(), remove() and peekFront() methods. It is used to store characters. Write a code segment to insert the following characters to a ‘myQueue’ object created from the queue class; ‘l’ , ‘m’, ‘n’, ‘o’.

iii) Write code segment to display all the values in a queue by removing them.

Question 4

Consider the below remove() method implemented for a circular queue. Code contains errors. Write the line numbers with errors and correct them.

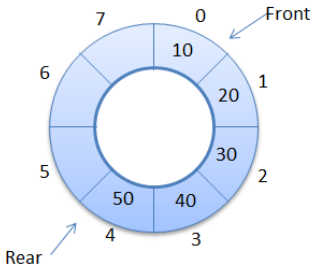
```
1. public int remove()
2. {
3.       if (rear == -1)
4.       {
5.             System.out.println(“Queue is empty”);
6.             return false;
7.       }
8.       else
9.       {
10.            int temp = queueArray[front++];
11.            nItems--;
12.            return temp;
13.      }
14.}
```

Question 5

Consider the following circular queue with initial values given below.

Initials values are:

- Front=0
- Rear=4
- Count=5



Show how the above parameter values (Front, Rear and Count) will change after each of the operations by completing the table given below.

i) insert(60)
ii) insert(70)
iii) delete( )
iv) insert(80)
v) insert(90)
vi) insert(100)

Question 6

"front - rear + 1 can be used to find the no of items in a linear queue" Do you agree with the above statement? If you agree, justify your answer using a diagram. If you do not agree, write the correct answer.