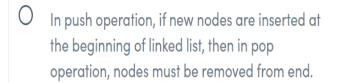
QUESTION 1 Which one of the following is an application of Queue Data Structure?				
O When a resource is shared among multiple consumers.	O When data is transferred asynchronously (data not necessarily received at same rate as sent) between two processes			
O Load Balancing	All of the above			
QUESTION 2 How many stacks are needed to implement a queue. Consider the situation where no other data structure like arrays, linked list is available to you.				
O 1				
О з	O 4			

QUESTION 3 1 marks

A priority queue can efficiently implemented using which of the following data structures? Assume that the number of insert and peek (operation to see the current highest priority item) and extraction (remove the highest priority item) operations are almost same.

0	Array	0	Linked List
•	Heap Data Structures like Binary Heap, Fibonacci Heap	0	None of the above

Which of the following is true about linked list implementation of queue?



O In push operation, if new nodes are inserted at the end, then in pop operation, nodes must be removed from the beginning.

\sim			
	D II	0.11	1
lacksquare	Both	of the	above

O None of the above

QUESTION 5

1 marks

Suppose a circular queue of capacity (n - 1) elements is implemented with an array of n elements. Assume that the insertion and deletion operation are carried out using REAR and FRONT as array index variables, respectively. Initially, REAR = FRONT = 0. The conditions to detect queue full and queue empty are

Full: (REAR+1) mod n == FRONT, empty: REAR == FRONT

Full: (REAR+1) mod n == FRONT, empty: (FRONT+1) mod n == REAR

O Full: REAR == FRONT, empty: (REAR+1) mod n == FRONT

O Full: (FRONT+1) mod n == REAR, empty: REAR == FRONT

• Let n insert and m (<=n) delete operations be performed in an arbitrary order on an empty queue Q. Let x and y be the number of push and pop operations performed respectively in the process. Which one of the following is true for all m and n? QUESTION 6 C/C++ Code An implementation of a queue Q, using two stacks S1 and S2, is given below: void delete(Q)(void insert(Q, x) { x=pop(S2); $n+m \le x \le 2n$ and $2m \le y \le n+m$ push (S1, x); if(stack-empty(S2)) then else while (!(stack-empty(S1))){ if(stack-empty(S1)) then { x=pop(SI); push(S2,x); return; print("Q is empty"); 0 $n+m \le x \le 2n$ and $2m \le y \le 2n$

O 2m <= x < 2n and 2m <= y <= n+m

O 2m <= x <2n and 2m <= y <= 2n

QUESTION 7	1 marks			
Consider the following operation along with Enqueue and Dequeue operations on queues, where k is a global parameter.				
MultiDequeue(Q){				
m = k				
while (Q is not empty and m $>$ 0) {				
Dequeue(Q)				
m = m - 1				
}				
}				
What is the worst case time complexity of a sequence of n MultiDequeue() operations on an initially empty queue? (GATE CS 2013) (A) $Theta(n)$ (B) $Theta(n+k)$ (C) $Theta(nk)$ (D) $Theta(n^2)$				
● A	Ов			
О с	Ор			

 Prints first n Fibonacci numbers O Prints numbers from 0 to n-1 C/C++ Code QUESTION 8 Consider the following pseudo code. Assume that IntQueue is an integer queue. What does the function fun do? woid fun(int n) q.enqueue(1); q.enqueue(0); for (int i = 0; i < n; i++) IntQueue q = new IntQueue(); print(a); q.enqueue(a + b); int a = q.dequeue(); q.enqueue(b); int b = q.dequeue(); O Prints first n Fibonacci numbers in reverse order. O Prints numbers from n-1 to 0 1 marks

QUESTION 9	1 marks			
Which of the following is NOT a common operation in	a queue data structure?			
O Enqueue	O Dequeue			
O Peek	Shuffle			
QUESTION 10 A Priority-Queue is implemented as a Max-Heap. Initially, it has 5 elements. The level-order traversal of the heap is given				
below: 10, 8, 5, 3, 2 Two new elements "1' and "7' are inserted in the heap in that order. The level-order traversal of the heap after the insertion of the elements is:				
O 10, 8, 7, 5, 3, 2, 1	O 10, 8, 7, 2, 3, 1, 5			
O 10, 8, 7, 1, 2, 3, 5	10, 8, 7, 3, 2, 1, 5			