NAME : _____

CLASS : _____

Unit-3 Test-1

16 Questions

DATE : _____

1. If the elements “A”, “B”, “C” and “D” are placed in a queue and are deleted one at a time, in what order will they be removed?

A ABCD

B DCAB

C DCBA

D ABDC

2. In linked list implementation of a queue, the important condition for a queue to be empty is?

A LINK is empty

B REAR is null

C None of the mentioned

D FRONT is null

3. Are stacks FIFO or FILO?

A FIFO

B LILO

C FILO

D LIFO

4. 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.

A 1

B 3

C 4

D 2

5. How many queues are needed to implement a stack. Consider the situation where no other data structure like arrays, linked list is available to you.

A 2

B 3

C 1

D 4

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

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

B None of the above

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

D Both of the above

7. 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

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

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

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

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

8.

```
MultiDequeue(Q){
   m = k
   while (Q is not empty and m  > 0) {
      Dequeue(Q)
      m = m - 1
   }
}
```

Consider the following operation along with Enqueue and Dequeue operations on queues, where k is a global parameter.

What is the worst case time complexity of a sequence of n MultiDequeue() operations on an initially empty queue?

A O(nk)

B O(n+k)

C O(n^2)

D O(n)

9. Suppose implementation supports an instruction REVERSE, which reverses the order of elements on the stack, in addition to the PUSH and POP instructions. Which one of the following statements is TRUE with respect to this modified stack?

A. A queue can be implemented where ENQUEUE takes a sequence of three instructions and DEQUEUE takes a single instruction.

B. A queue cannot be implemented using this stack.

C. A queue can be implemented where both ENQUEUE and DEQUEUE take a single instruction each.

D. A queue can be implemented where ENQUEUE takes a single instruction and DEQUEUE takes a sequence of two instructions.

10.

```
while Q is not Empty do
    if S is Empty OR Top(S) ≤ Head(Q) then
        x := Dequeue(Q);
        Push(S,x);
    else
        x := Pop(S);
        Enqueue(Q,x);
    end
end
```

Let Q denote a queue containing sixteen numbers and S be an empty stack. Head(Q) returns the element at the head of the queue Q **without** removing it from Q. Similarly Top(S) returns the element at the top of S **without** removing it from S. Consider the algorithm given below.

The maximum possible number of iterations of the while loop in the algorithm is

A. 256

B. 64

C. 32

D. 16

11.

```
void fun(int n)
{
    Stack S;  // Say it creates an empty stack S
    while (n > 0)
    {
      // This line pushes the value of n%2 to stack S
      push(&S, n%2);

      n = n/2;
    }

    // Run while Stack S is not empty
    while (!isEmpty(&S))
       printf("%d ", pop(&S)); // pop an element from S and print it
}
```

Following is C like pseudo code of a function that takes a number as an argument, and uses a stack S to do processing.

What does the above function do in general?

A. Prints the value of Logn

B. Prints binary representation of n in reverse order

C. Prints the value of Logn in reverse order

D. Prints binary representation of n

12. The following postfix expression with single digit operands is evaluated using a stack:

```
8 2 3 ^ / 2 3 * + 5 1 * -
```

Note that ^ is the exponentiation operator. The top two elements of the stack after the first * is evaluated are:

A 6,1

B 5,7

C 1,5

D 3,2

13. If the sequence of operations - push (1), push (2), pop, push (1), push (2), pop, pop, pop, push (2), pop are performed on a stack, the sequence of popped out values

A 2,1,2,2,2

B 2,2,1,2,2

C 2,2,1,1,2

D 2,1,2,2,1

14. The five items: A, B, C, D, and E are pushed in a stack, one after other starting from A. The stack is popped four items and each element is inserted in a queue. The two elements are deleted from the queue and pushed back on the stack. Now one item is popped from the stack. The popped item is

A B

B A

C C

D E

E D

15. Consider the following operations performed on a stack of size 5 : Push (a); Pop() ; Push(b); Push(c); Pop(); Push(d); Pop();Pop(); Push (e) Which of the following statements is correct?

A None of the above

B Underflow occurs

C Stack operations are performed smoothly

D Overflow occurs

16. Which of the following is not an inherent application of stack?

A Job scheduling

B Reverse a string

C Evaluation of a postfix expression

D Implementation of recursion

Answer Key

1. a	2. d	3. c	4. d
5. a	6. d	7. a	8. d
9. a	10. a	11. d	12. a
13. c	14. e	15. c	16. a