CSE 102: Data Structures and Algorithms
Quiz 2 (Total marks : 10)
06 June, 2022
Total Time: 30 minutes

Name: **Roll no. :**

Please write legibly, ambiguous answers will not be given credits. It is a closed book quiz.
All the best!

Q1. What is the output of the following function where start pointing to the first node of the following linked list? 1->2->3->4->5->6 **[1 mark]**

```
void fun(struct node* start)
 {
  if(start == NULL)
   return;
  printf("%d ", start->data);
  if(start->next != NULL )
   fun(start->next->next);
  printf("%d ", start->data);
}
```

A. 1 4 6 6 4 1
B. 1 3 5 1 3 5
C. 1 2 3 5
D. 1 3 5 5 3 1

Ans. D (Binary marking only)

Q2. **Infix expression:** The expression of the form **a op b**. When an operator is in-between every pair of operands. (operation is Binary)
Postfix expression: The expression of the form **a b op**. When an operator is followed for every pair of operands. (operation is Binary)
Given the following infix expression:
(5 + 2) * 3 + 9 / (2 + 1 * 7) - 6

a.) Convert the above infix expression to postfix using stack **[2 marks]**

Ans. Final expression- 52+3*9217*+/+6-

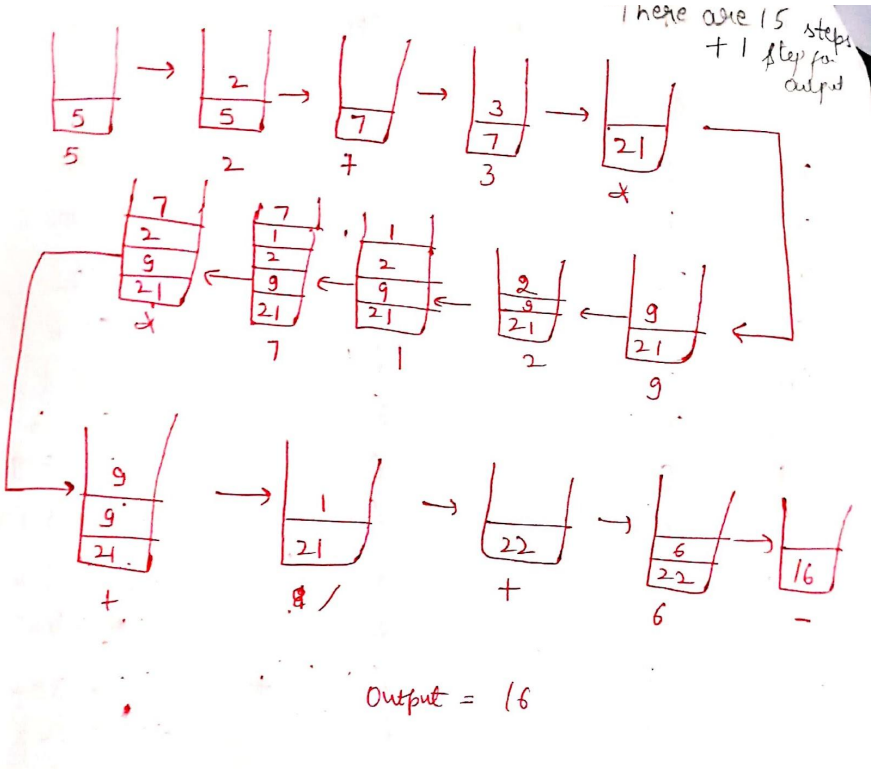
- If steps are correct, but there is some mistake in the final expression- 1 mark
- If final expression is correct, but the steps don't match at all- 0 mark (ask the student how he derived the expression without following the correct steps)
- If everything is correct- 2 marks

a) $(5+2) * 3+9/(2+1*7)-6$

	Symbol	Stack	Postfix
1)	(	(	
2)	5	(	5
3)	+	(+	5
4)	2	(+	52
5)	)		52+
6)	*	*	52+
7)	3	*	52+3
8)	+	+	52+3*
9)	9	+	52+3*9
10)	/	+/	52+3*9
11)	(	+/(	52+3*9
12)	2	+/(*	52+3*92
13)	+	+/(+	52+3*92
14)	1	+/(+	52+3*92 1
15)	*	+/(+*	52+3*92 1
16)	7	+/(+*	52+3*9217
17)	)	+/	52+3*9217*+
18)	—	-	52+3*9217*+/+
19)	6	-	52+3*9217*+/+6
20)			52+3*9217*+/+6-

b.) Evaluate the postfix expression of part a, using stack **[2 marks]**

Ans. **Final output- 16**



Q3. Write the recursive solution for reversing the linked list. **[2 marks]**

Ans. The base case is the empty list, or having a single node , when the Front (head) can be returned. The continuation case calls the function with a node next to the head.

```
public static Node Reverse (Node head); {
if (head == null || head.getLink == null)
        return head;
Node temp= head.getLink;
head.getLink = null;
Node rest = Reverse(temp);
temp.setLink(head);
return rest;
}
```

(Some Partial marks can also be given as per your judgment)

Q4. Given an empty queue. You perform a series of operations. Assume that everytime you perform a dequeue operation, you also print the value of the element dequeued.
Write the result which will be printed on performing the following sequence of operations: **[1 mark]**

enqueue(7), enqueue(4), dequeue(), enqueue(6), enqueue(2), dequeue(), dequeue(), enqueue(8), enqueue(3), dequeue(), dequeue(), dequeue()

Ans. 746283 (Binary marking only)

Q5. Mention at least two tree traversal techniques? How are they different? **[2 marks]**

Ans. 1. Inorder Traversal

2. Preorder Traversal
(or it can be Inorder, PostOrder OR Preorder, PostOrder- All are correct)

In Inorder Traversal- Left Root Right
Preorder Traversal- Root Left Right
[0.5 point for the name of each traversal, 0.5 each for order in which nodes are traversed]