**Theory Assignment 02**

**Marks**

1. Between array based stack implementation and linked-list based stack implementation which is better when I need random access in the stack? Explain the reasons. **15**
2. What is the time complexity of push, pop and top operations in a stack? **10**
3. Suppose you need a stack of characters, a stack of integers and a stack of real numbers. How will you implement this scenario using a single stack? **15**
4. What is a postfix expression and why do we need it? How is it evaluated using a stack for the below example? You need to show all the steps. **15**

abc\*+de\*+

1. Simulate balanced parentheses check using stack for the below example. You need to show all the steps. **15**

( ( [ ][ ]{ ( ) } ) )

1. Sort a stack of integers using another stack for the below example. You need to show all the steps. **15**

Stack -> [3,4,6,2,5]

1. Convert the infix expression to postfix expression using a stack. You need to show all the steps. **15**

a+b\*c+d\*e