**DATA STRUCTURES USING C**

**ASSIGNMENT 1**

**Assignment Submission date:17/09/2019**

1. Define Data Structures.
2. With a proper sketch Outline the classification of Data Structures.
3. Explain following Data Structures
   * 1. Arrays
     2. Stack
     3. Queue
4. Define Dynamic Memory Allocation? Briefly explain DMA functions with their general syntax.
5. What is recursion? Write a C language program using recursive function to find the sum of all digits of the number.
6. Consider an array consists of the following numbers: 10,15,20,22,25,30,35 Search for item 30 using linear search, Binary Search.
7. Convert the following infix notation to postfix notation

a / b – c + d \* e – a \* c

( ( a + b ) / d - ( ( e - f ) + g )

1. Evaluate the following Postfix expressions using Stack
2. 6 2 3 + - 3 8 2 / + \* 2 $ 3 +
3. 6 5 2 3 + 8 \* + 3 + \*

Show the detailed contents of Stack at each step.

1. (a)Distinguish between Static Memory Allocation, Dynamic Memory Allocation.
2. Distinguish between malloc(), calloc() DMA functions.
3. Write-down the operations performed on stack and Queue.
4. Suppose the following numbers are stored in an array

**A:32, 51, 27, 85, 66, 23, 13, 57**

(a)Apply Bubble Sort to sort the numbers. Write output after every pass. Also write the output of pass 5 if pass 5 exists.

(b)Apply Insertion Sort to sort the numbers. Write output after every step performed.