SAINIK SCHOOL AMARAVATHINAGAR
SERIES TEST - III

DATE: **COMPUTER SCIENCE (083)** **MAX MARKS : 70**

CLASS: XII **MAX TIME : 3h**

General Instructions:

1. ***Please check that this question paper contains 3 printed pages.***
2. ***Please check that this question paper contains 6 questions.***
3. ***Please write down the serial number of the question before attempting it.***
4. ***All questions are compulsory.***
5. ***Programming language: Python.***

1. Answer the Followings each carries one mark (1 x 4 = 04)

a) Define Data Structure

b) List the different types of Data Structures.

c) What is Linked List?

d) What is non linear data structure?

2 Answer the followings each carries 2 marks (2 x 5 = 10)

a) Write a program to search a number using **`Linear Search`** method. You should implement by using numpy module.

b) Write a function to delete a element from sorted list.

c) Write a function to insert an element in a sorted list.

d) What is sorting linear list? Give one example.

e) What is list comprehension? How is it useful?

3 Answer the followings each carries 2 marks (2 x 5 = 10)

a) What is ragged List? Give example

b) Differentiate between regular 2D list and ragged list

c) What is nested list? Give examples

d) Write a program to transpose the matrix

e) What are the applications of stack?

4 Answer the followings each carries 3 marks (3 x 5 = 15)

a) What is queue? Enlist some applications of queue

b) Write a function to sort a numbers using **`Selection Sort method`**.

c) Suppose an array P containing float is arranged in ascending order. Write a user defined function in C++ to search for one float from p with the help of binary search method. The function should return an integer 0 to show absence of the number in the array. The function should have the parameters as (1) an array P (2) the number DATA to be searched (3) number of elements N.

d) Write a function to sort a numbers using **`Bubble Sort method`**.

e) Considering the following key set: **`42, 29,74,11,65,58`** use **`Insertion Sort`** to sort the data in ascending order and indicate the sequences of steps required

5 Answer the followings each carries 3 marks (3 x 5 = 15)

a) Evaluate the following postfix expression. Show the status of Stack after execution of each operation separately:

`45, 45, +, 32, 20, 10, /, -,*`

b) Evaluate the following postfix notation of expression: (Show status of Stack after each operation)

`False, True, NOT, OR, True, False, AND, OR.`

c) Obtain the postfix notation for the following infix notation of expression showing the contents of the stack and postfix expression formed after each step of conversion:

`(P–Q)/(R*(S–T)+U)`

d) Write the equivalent infix expression for

`10, 3, *, 7, 1, --,*, 23, +`

e) Write definition of a method/function **`AddOddEven(VALUES)`** to display sum of odd and even values separately from the list of VALUES.

For example:

If the VALUES contain [15, 26, 37, 10, 22, 13]
The function should display
Even Sum: 58
Odd Sum: 65

6. **Answer the followings each carries 4 marks (4 x 4 = 16)**

a) Write a function in Python to merge the contents of two sorted arrays A & B into third array C. Assuming array A and B are sorted in ascending order and the resultant array C is also required to be in ascending order.

b) Write a complete STACK program.

c) Write a complete QUEUE program.

d) Write a program to search a number using **Binary search method**.

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