SOUTH EASTERN UNIVERSITY OF SRI LANKA
THIRD EXAMINATION IN BACHELOR OF INFORMATION AND COMMUNICATION TECHNOLOGY - 2018/2019
SEMESTER – I, JULY / AUGUST 2021

SWT 21032 – PRACTICAL FOR DATA STRUCTURES AND ALGORITHM

Answer all Questions **Time Allowed: 03 hours.**

Question 01:

Write a program to maintain the database of players in a sporting club. The actions need to be performed are as follows:

- Insert a new player when the player joins the club.
- Check to see whether a particular player is present, by searching for the player's number
- Delete a player from the club once he is no longer comes to the club.

i. Assuming that the players are given a unique number on their admission, create an array to have 5 number of items as follows:

{89, 70, 34, 45, 63}

(25 Marks)

ii. Implement a method for searching and find player number 34.

(25 Marks)

iii. Implement a method for insertion and insert a new player having their player number as 55 at position 3 of the array.

(25 Marks)

iv. Implement a method for deletion, delete the student number 70 and display the current items available in the array.

(25 Marks)

[Total 100 marks]

Question 02:

Write a java program to implement a *Stack* using the steps given below.

i. Create a *stack* with the size eight.

(05 Marks)

ii. Include methods to check whether the array is empty and to check whether the array is full.

(05 Marks)

iii. Implement the following methods in your program.

a) push()
b) peek()
c) pop()
d) display()

(40 Marks)

iv. Perform the following in the main method of your program.

a) Push 12, 47, 56, and 88 into the stack.
b) Peek 47 inside the stack.
c) Again push 21 and 35 into that stack.
d) Peek top element into the stack.
e) Pop top element and display.
f) Also push 7 more element and display.
g) Explain the reason for the nature of your output.

(50 Marks)

[Total 100 marks]

Question 03:

A. Write a program to implement a Node Class and the Tree Class that will be used in Binary Search Tree implantation.

(10 Marks)

B. Implement 'AddNode' method to insert or add new node into the Binary Search Tree.

(20 Marks)

C. Implement the 'FindNode' method to find a particular node with a specified key value.

(20 Marks)

D. To execute the methods implemented, write the relevant statements in the main method.

   a) Implement the Binary Search Tree by adding nodes 60, 70, 45, 3, 80, 110 and 25.

   b) Search the Node 45.

(20 Marks)

E. Modify the program to add methods such as 'InOrder Traversal', 'PreOrder Traversal' and 'PostOrder Traversal' of the Binary Search Tree.

(30 Marks)

[Total 100 marks]

Question 04:

Write a java program for the followings,

A. Create a class called Sorting with main method.

(05 Marks)

B. Create two integer arrays called **myarray1[]** and **myarray2[]** with 6 elements in main method as follows.

myarray1[] – {56, 45, 12, 37, 73, 60}

myarray2[] – {34, 12, 90, 87, 24, 56}

(15 Marks)

C. Create a method called **insertionSort()** for insertion sort algorithm by using **myarray1[]** array.

(30 Marks)

D. Create an another method called **bubbleSort()** for bubble sort algorithm using **myarray2[]** array.

(30 Marks)

E. Display the output showing both arrays and their status before and after applying the relevant sorting algorithm.

(20 Marks)

[Total 100 marks]

**** END ****