TEST 1- Design **Max mark: 3**

_____Array Implementation_____

insertStudentDetails(s,D) **Max mark: 2**

1. Let ***n*** be no. of elements in array D.
2. pos=0

//Find position where elements should be entered

3. For i in range 0 to n-1
    3.1. if(*D[i].student_id<s.student_id*)
        3.1.1. pos=pos+1
    3.2. else
        3.2.1. break (steps 1-3: 1 mark)

//Move all elements right by 1 position having index greater than position where to insert element

4. For i in range *n*-1 to *pos, i- -*
    4.1. *D[i+1].student_id=D[i].student_id*
    4.2. *D[i].student_name=D[i].student_name*

//Insert element at correct position

5. *D[i].student_id=s.student_id*

    D[i].student_name=s.student_name (steps 4,5: 1 mark)

printSortedList(D) **Max mark: 1**

1. Let ***n*** be no. of elements in array D.
2. For i in range 0 to n-1
    2.1. print *D[i]. student_id D[i].student_name "\n"*

Linked List Implementation

insertStudentDetails(s,D) **Max mark: 2**

//Let *head* points to the head of D. Insert element at the head.

1 *If (head== NULL or head.student_id>=s. student_id)*

1.1 *s.next = head*

1.2 *head = s* (step 1: 0.5 marks)

2 *Else*

//Find position where elements should be entered

3 *temp = head*

4 *while (temp.next != NULL && temp.next.student_id < s.student_id)*

4.1 *temp = temp.next* (step 2-4: 1 mark)

//Insert element at correct position

5 *s.next = temp.next*

6 *temp.next = s* (step 5-6: 0.5 marks)

printSortedList(D) **Max mark: 1**

1. *temp = head*
2. *while (temp != NULL)*

2.1 print *temp.student_id temp.student_name \n*

2.2 *temp = temp.next*

_____BST Implementation_____

insertStudentDetails(s,D) **Max mark: 2**

1. *temp = D.root*
2. *parent* =NIL

//Find position where elements should be entered

3. while(*temp*)
    - 3.1. *parent = temp*
    - 3.2. *if (temp.student_id<s.student_id)*
        - 3.2.1. *temp=temp.left*
    - 3.3. *else*
        - 3.3.1. *temp=temp.right* (step 1-3: 1 mark)

//Insert element at given position

4. if (parent=NIL)
    - 4.1. *D.root*=s
5. else if (*parent.student_id>s.student_id)*
    - 5.1. *parent.left=s*
6. else
    - 6.1. *parent.right=s* (step 4-6: 1 mark)

printSortedList(D) **Max mark: 1**

1 *temp=D.root*

2 if *temp* not equal to *NIL*

- 2.1 *printSortedList(temp.left)*
- 2.2 *print temp.student_id temp.student_name \n*
- 2.3 *printSortedList(temp.right)*