## Exam: MID SEMESTER ASSIGNMENT

## SPRING 2020

### Subject: Data Structure & Algorithm

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Q.1(a):      Let the size of A[ ] be 15654 and the lower bound be 36767, Calculate the upper bound.

Ans.1(a):

Solution:

Ub = ?

As     Size of A [ ] = ub − lb + 1

Ub = Size of A [ ] + lb − 1

Ub = 15654 + 36767 − 1

So,       **Ub = 52,420 Answer**

Q.1 (b):      Suppose a list of 350 elements is to be sorted using buble sort, then find

    i.      Total Number of passes.
    ii.     Total Number of Steps.
    iii.    Number of Steps in pass # 137.
    iv.    Number of Steps in pass # 193.

**Ans. 1 (b):**

     i.  As, no of passes = n − 1

$$= 350 - 1$$

$$= 349.$$

    ii.  As, no of steps $= \dfrac{n\,(n-1)}{2} = \dfrac{350}{2}\,(349)$

$$= 61,075$$

   iii.  As, no of Steps in $137 = n - pass\ no$

$$= 349 - 193 = 212$$

   iv.  As, no of Steps in $193 = 349 - 193$

$$= 156$$

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**Q.2:** Sort the give list using selection sort.

$$10 , 15 , 0 , 7 , 8 , 6$$

**Ans.2:**     Selection Sort

      n=6

      Steps = n − 1

      = 6 − 1

      = 5

**Step # 1:**

   **Element = 15**

   10 , (15) , (0) , 7 , 8 , 6

   0 , 15 , 10 , 7 , 8 , 6

**Step # 2: Element = 15**

   0 , (15) , 10 , 7 , 8 , (6)

0 , 6 , 10 , 7 , 8 , 15

**Step # 3: Element = 10**

0 , 6 ,⑩ , ⑦ , 8 , 15

0 , 6 , 7 , 10 , 8 , 15

**Step # 4: Element = 10**

0 , 6 , 7 ,⑩ , ⑧ , 15

0 , 6 , 7 , 8 , 10 , 15

**Step # 5: Element = 10**

0 , 6 , 7 , 8 , 10 , 15

So

**10** is at it's **proper position**.

So the list is **sorted**.

Q.3: MCQ's

Ans.3:

i.      **Physical** data structures may deal with only a single value.
ii.     **Logical** data structres with multilple values.
iii.    The logical / mathematical organization of data is called **Data Structure.**
iv.     A tree is a **Number – Linear** data structure.
v.      An array is a **Linear** data structure.
vi.     List most be sorted for **Linear** searching.
vii.    17 int – div 2 = **8**
viii.   An investigation parade of criminals is an example of **File.**
ix.     Number of fields in a record is called **Degree of record.**
x.      Number of records in a block is called **Blocking Factor.**