Tutorial - III

Ans 1:

Ans 2 :-

```
for (int i=1; i<n; i++)
{
    j = i-1
```

Ans 3 :-

Bubble sort → $O(n^2)$

Insertion sort = $O(n^2)$

Selection Sort = $O(n^2)$.

Merge sort = $O(n \log n)$.

Quick sort = $O(n \log n)$.

Count sort = $O(n)$.

Bucket sort = $O(n)$.

Ans 4 :-

Online sort → Insertion sort.

Stable sort → Merge sort, Insertion sort, Bubble sort.

Inplace sort → Bubble sort, Insertion sort, Selectionsort.

Ans 5 :- Iterative Binary search

```
while ( low <= high)
{
    int mid = (low + high)
              /2;
    if ( arr[mid] == key)
        return true;
    else if ( arr[mid]
              > key)
        high = mid+1;
    else
        low = mid+1;
}
```

Ans 6 :- $T(n) = T(n/2) + T(n/2) + C$

Ques 5 :-

```
int Binary_search ( arr, low, high)
{
    int mid = (high + low)/2

    if ( arr [mid] == key)
        return true;

    else if ( arr [mid] > key)
        Binary_search (arr, low, mid - 1);

    else
        Binary_search ( arr, mid+1, high);

}
return false;
```

Q7 :-

Solution :-