EC6301 OBJECT ORIENTED PROGRAMMING AND DATA STRUCTURES

2Mark Questions with Answers

UNIT-V

SORTING and SEARCHING

1. What is insertion sort? How many passes are required for the elements to be sorted?

One of the simplest sorting algorithms is the insertion sort. Insertion sort consist of N-1 passes. For pass P=1 through N-1 , insertion sort ensures that the elements in positions 0 through P-1 are in sorted order .It makes use of the fact that elements in position 0 through P-1 are already known to be in sorted order .

2. Write the function in C for insertion sort?

```
void insertionsort(elementtype A[ ] , int N)
{
int j, p;
elementtype tmp;
for(p=1 ; p <N ;p++ )
{
        tmp = a[ p] ;
        for ( j=p ; j>0 && a [ j -1 ] >tmp ;j--)
         a [ j ]=a [j-1 ] ; a [ j ] = tmp ;
        }
}
```

3. Who invented shell sort? Define it?

Shell sort was invented by Donald Shell. It works by comparing element that are distant. The distance between the comparisons decreases as the algorithm runs until the last phase in which adjacent elements are compared. Hence it is referred as diminishing increment sort.

4. Write the function in c for shell sort?

```
void Shellsort(Elementtype A[ ],int N)
{
        int i , j ,
        increment ;
        elementtype tmp ;
        for(elementtype=N / 2;increment > 0;increment / = 2)
                for( i= increment ; i <N ; i ++)
                {
                        tmp=A[ ];
                        for( j=I; j>=increment; j - =increment)
                        if(tmp< A[ ]=A[j increment])
                                A[ j ]=A[ j increment]; Else Break;
                                A[ j ]=tmp;

                }
}
```

5. What is maxheap?

If we want the elements in the more typical increasing sorted order,we can change the ordering property so that the parent has a larger key than the child. it is called max heap.

6. What are the two stages for heap sort?

Stage 1: Construction of heap Stage 2: Root deletion N-1 times

7. What is divide and conquer strategy?

In divide and conquer strategy the given problem is divided into smaller problems and solved recursively. The conquering phase consists of patching together the answers. Divide and conquer is a very powerful use of recursion that we will see many times.

8. Differentiate between merge sort and quick sort?

Mergesort	Quicksort
Divide and conquer strategy	Divide and conquer strategy
Partition by position	Partition by value

9. Mention some methods for choosing the pivot element in quicksort?

1. Choosing first element
2. Generate random number
3. Median of three

10. What are the three cases that arise during the left to right scan in quicksort?

1. i and j cross each other
2. i and j do not cross each other
3. i and j points the same position

11. What is the need of external sorting?

External sorting is required where the input is too large to fit into memory. So external sorting
is necessary where the program is too large.

12. Define two-way merge?

It is a basic external sorting in which there are two inputs and two outputs tapes.

14. Define multi way merge?

If we have extra tapes then we can expect to reduce the number of passes required to sort our input. We do this by extending two way merge to a k-way merge.

15. Define polyphase merge?

The k-way merging strategy requires the use of 2 k tapes. This could be prohibitive for some applications. It is possible to get by with only k+1 tapes.

16. What is sorting?

Sorting is the process of arranging the given items in a logical order. Sorting is an example where the analysis can be precisely performed.

17. What is mergesort?

The mergesort algorithm is a classic divide and conquer strategy. The problem is divided into two arrays and merged into single array

18. What are the properties involved in heapsort?

1. Structure property
2. Heap order property