Question 1

a) Write the syntax for the declaration of   1) one dimensional array

2) two dimensional array   [2]

b) State the differences between linear search and binary search   [2]

c) Define sorting. Give one difference between bubble sort and selection sort   [2]

Question 2

a) Define i) function

ii) function prototype

iii) function signature

iv) function definition   [4]

b) Difference between a actual parameter and a formal parameter   [1]

c)Difference between a pure function and a impure function   [1]

d)Write the formula for address calculation of

1) one dimensional array

2) two dimensional array - row major order

3) two dimensional array - column major order   [3]

e) What is the difference between String and StringBuffer class   [1]

Question 3

a) **Give the output for the following when function demo() is invoked:**

```
void demo()
{
int A[ ][ ]={{2,5},{6,7}};
int B[ ][ ]={{3,-1},{0,-5}};
int C[ ][ ]=new int[2][2];
int i=0, j=0;
for(i=0;i<2;i++)
{
for(j=0;j<2;j++)
{
C[i][j]=A[i][j]-B[i][j];
System.out.print(C[i][j]+"\t");
}
System.out.println();
}
```

```
System.out.println("I="+i);
System.out.println("J="+j);
}
```

[3]

b) Read the program code carefully.
```
class TheOutput
{
void unknown(int num , int d)
{
int quo=0 , rem=0;
while(num>1)
{
num=num - d;
quo=quo+1;
}
rem=num;
System.out.println("Result 1="+quo);
System.out.println("Result 2="+rem);
}
}
```

Assuming that all the data members are positive in nature, answer the following:[Show dry working also]

1)What will be final values of quo, rem when the function unknown(13,2) is invoked?

2)What will be final values of quo, rem when the function unknown(27,3) is invoked?

[4]

c) Give the output for the following:
```
void main()
{
String s="orange" ;
String s1=s.substring(2) ;
String s2=s.substring(1,4) ;
System.out.println("s1= "+s1) ;
System.out.println("s2= "+s2) ;
}
```

Question 4

[2]

Write a Java program to print the following pattern

```
        @
      @ @ @
    @ @ @ @ @
  @ @ @ @ @ @ @
```

[5]

Question 5

Write a Java program to accept a sentence in capital letters and print all the palindromic words in that sentence. For eg. if the sentence is " MOM AND DAD IS COMING TOMORROW" It should print MOM , DAD [10]

Question 6

Write a Java program to perform binary search on a set of 20 integers that are unsorted [10]

Question 7

Write a Java program to compute volume of 1) cube   2) cuboid 3) cylinder 4) sphere using function overloading. Define a main function as well.[Volume of cube = a^3, cuboid= l x b x h, cylinder = $\Pi r^2 h$, sphere= $4/3 \Pi r^3$] [15]

Question 8
A class **sort** contains an array of integers.
Class name: **sort**

Data members / instance variables:
a[ ]   - integer array to store numbers
size - integer as actual size of the array

Member functions:
void inpdata( ): to input the size and integers into the array upto the size
void SelSort( ): to sort the array in ascending order using selection sort technique.
void DispArray( ): to print the elements of the array a[ ]
Specify the class **sort** giving details of all the functions and.write a main( ) to input the array and print array before and after sorting. [15]