1. With a java program example, explain the concepts of abstraction, encapsulation, inheritance and polymorphism.

ABSTRACTION

The concept of focusing only on the important details and leaving the inner workings of a system out of focus is known as abstraction.

Eg: We know what the pedals of a car do but we do not concern ourselves with how they perform those tasks.

ENCAPSULATION

Encapsulation is a combination of “En” and “Capsulate” which means, “wrap up inside a capsule”. This represents the practice of binding code and data into a secure capsule and protecting it from the outside world.

INHERITANCE

The process by which one class inherits the public and protected data members and properties of another class is known inheritance.

POLYMORPHISM

Means “Having many forms”. This means that an interface may have several general purpose actions.

Eg: A function area() can be used to calculate the area of a triangle or a rectangle

2.A) what is byte code? How does it help java attain platform independency?

Byte code is the output of the Java complier. It is a highly detailed list of instructions for execution by the Java Virtual Machine. The Java Virtual Machine may be installed on a host of devices and does not concern itself with the machine the Java code was written on.

B) Explain type conversion, casting and type promotion rules of java.

When one data type is assigned to another type of variable, an automatic type conversion takes place if the following two conditions are met

1)The two types of data are compatible with each other

2) The destination type is larger than the source type

Note that there is no automatic type conversions from int to char or Boolean.

Type casting is the explicit type conversion between non compatible types.

Syntax is (target-value)value;

eg: byte b;

int a=10,222;

b=(byte)a;

Type promotion takes place under certain circumstances

1. All Byte and short operands are promoted to int when computing
2. All operands are converted into long if there is present a long operator in the equation
3. In an operand is float, the whole operation is float
4. If any of the operands is double, the result is double
5. A)Explain the ‘&’, ‘>>’, ‘<<’, ‘>>>’, ‘^’ operators with the help of examples.

<< Left Shift

This operator shifts all bits of an integer to the left by a particular value. If a byte is left shifted, it is first type promoted to int.

>> Right Shift

This operator shifts all bits to the right by a specified value

>>> Unsigned Right shift

Shifts zeros into higher order bits.

B) Demonstrate the for-each version of for loop.

4. A) Demonstrate the use continue and break(different forms) with the help of a program example.

B) what is recursive function and why is it expensive? Explain this with factorial example.

5. Create a class called **student** with name, reg\_no and marks in 5 subjects as member variables. Use constructor to initialize these variables. Provide a method called average which will calculate the average marks of the student.

Write another class which has **main** method, which will create an array of 5 objects of student class. Initialize all these objects by receiving relevant data from keyboard. From main , display the details of student who has the highest average.

6. With the help of a program, demonstrate multi level inheritance for at least 3 classes.

7. What are packages? Discuss the visibility mechanism of classes associated with packages.