

UNIT II INHERITANCE AND INTERFACES

PART A

1 a) What is meant by inheritance.

Or

1 b) Define inheritance.

Answer:

Inheritance is a mechanism in which one object acquires all the properties and behaviors of parent object. It is process of deriving a new class from an existing class.

Syntax:

```
class Subclass-name extends Superclass-name
{
    //methods and fields
}
```

2 a) List out the types of inheritance.

Or

2 b) What are the types of inheritance?

Answer:

- Single inheritance
- Multilevel inheritance
- Hierarchical inheritance
- Multiple inheritance
- Hybrid inheritance

3 a) How do you implement multiple inheritance in java.

or

3 b) How multiple inheritance is implemented in java.

Answer:

Java does not allow multiple inheritance:

- To reduce the complexity and simplify the language
- To avoid the ambiguity caused by multiple inheritance

It can be implemented using Interfaces.

4 a) Define super class and subclass.

Or

4 b) What is super class and subclass?

Answer:

The class which inherits the properties of other is known as subclass. It is otherwise called as derived class or child class.

The class whose properties are inherited is known as super class. It is otherwise called as base class or parent class.

Syntax:

```
class subclass_name extends superclass_name
{
    //methods and fields
}
```

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5 a) State the use of keyword super.

Or

5 b) What is the use of super keyword?

Answer:

There are three ways for using super keyword

- i) Invoke the method of immediate parent class
- ii) To access the class variables of immediate parent class
- iii) To invoke the immediate parent class constructor

6 a) Write short notes on Object class.

Or

6 b) Define Object class.

Answer:

The Object class is the parent class of all the classes in java by default (directly or indirectly). The java.lang.Object class is the root of the class hierarchy. Some of the Object class are Boolean, Math, Number, String etc.

7 a) Define abstract class.

Or

7 b) What is abstract class?

Answer:

Any class that contains one or more abstract methods must also be declared as abstract. Abstract keyword should be used in front of the class keyword. An abstract class cannot directly instantiated with the new operator.

Syntax:

```
abstract datatype methodname();
```

Example:

```
public abstract String getDescription();
```

8 a) List out the rules in defining abstract classes.

Or

8 b) What are the rules for defining abstract classes

Answer:

- An abstract class may have concrete (complete) methods.
- An abstract class may or may not have an abstract method. But if any class has one or more abstract methods, it must be compulsorily labeled abstract.
- Abstract classes can have Constructors, Member variables and Normal methods.
- Abstract classes are never instantiated
- A class derived from the abstract class must implement all those methods that are declared as abstract in the parent class.
- If a child does not implement all the abstract methods of abstract parent class, then the child class must need to be declared abstract.

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9 a) What are the uses of final keyword?

Or

9 b) List out the uses of final keyword.

Answer:

The keyword final has three uses:

- i) To create the equivalent of a named constant
- ii) Other two uses of final apply to inheritance.

10 a) What is finalize() method?

Or

10 b) Define finalize() method?

Answer:

The finalize() method is called just before an object is garbage collected. It is used to dispose system resources, perform clean-up activities and minimize memory leaks.

Syntax

```
protected void finalize()    // finalize() is called just once on an object
{
    .....
}
```

11 a) What is blank or uninitialized final variable?

Or

11 b) Define blank or uninitialized final variable.

Answer:

- A final variable that is not initialized at the time of declaration is known as blank final variable.
- If we want to create a variable that is initialized at the time of creating object and once initialized may not be changed, it is useful.
- It can be initialized only in constructor.

12 a) Define static blank final variable.

Or

12 b) What is static blank final variable?

Answer:

A static final variable that is not initialized at the time of declaration is known as static blank final variable. It can be initialized only in static block.

Example of static blank final variable

```
public class A
{
    static final int data;    //static blank final variable
    static
    {
        data=50;
    }
    public static void main(String args[])
    {
```

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```
        System.out.println(A.data);
    }
}
```

13 a) What is meant by interface?

Or

13 b) Define interface.

Answer:

Interface is similar to class. It is a collection of abstract methods. Along with abstract methods, an interface may also contain constants, default methods, static methods, and nested types. Any number of classes can implement an interface. One class can implement any number of interfaces.

14 a) How to define an interface.

Or

14 b) Write the syntax for defining an interface.

Answer:

An interface is defined like a class

Syntax

```
interface interfacename
{
    return-type method-name1(parameter-list);
    return-type method-name2(parameter-list);
    type final-varname1 = value;
    type final-varname2 = value;
    //-----
    return-type method-nameN(parameter-list);
    type final-varnameN = value;
}
```

15 a) What is object cloning?

Or

15 b) Define object cloning.

Answer:

Cloning is a copy of a variable holding an object reference. The original and copy are reference to the same object. A clone is simply an exact copy of original.

16 a) Define nested interface.

Or

16 b) What is nested interface?

Answer:

An interface which is declared inside another interface or class is called nested interface. They are also known as inner interface. Since nested interface cannot be accessed directly, the main purpose of using them is to resolve the namespace by grouping related interfaces (or related interface and class) together.

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17 a) What is inner class?

Or

17 b) Define inner class.

Answer:

An inner class is a class that is defined inside another class. These classes can have access modifier as abstract and final.

Syntax:

```
class Java_Outer_class
{
    //code
    class Java_Inner_class
    {
        //code
    }
}
```

18 a) What is method-local inner class?

Or

18 b) Define method-local inner class.

Answer:

It is defined within a method of the enclosed class. Local inner class can use the local variables of the method.

19 a) What is Anonymous inner class?

Or

19 b) Define Anonymous inner class.

Answer:

Inner class without name is called as Anonymous inner class. It can be instantiated only once. It is usually declared inside a method, a curly braces ending with semicolon. It doesnot have a constructor because it doesnot have a name. It cannot be static.

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20 a) Define ArrayList.

Or

20 b) What is ArrayList?

Answer:

ArrayList class is similar to an array, but it automatically adjusts its capacity as new elements are added and removed. ArrayList is a generic class with type parameter.

Syntax:

ArrayList holds a classname enclosed in angle brackets.

```
ArrayList<classname>
```

Example:

```
ArrayList<employee>
```

21 a) What is String?

Or

21 b) Define String.

Answer:

Java Strings are sequence of Unicode characters. String is a predefined class in Java. Each quoted string is an instance of the string class.

Example:

```
String e= " " //an empty string
```

```
String greeting=" Hello";
```

22 a) Define String Constructor.

Or

22 b) What is String Constructor?

Answer:

The string class supports several constructors. To create an empty string call the default constructor.

Example:

```
String s=new String();
```

It will create an instance of string with no characters in it.

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23 a) Define String Length.

Or

23 b) What is String Length?

Answer:

The length of a string is the number of characters that it contains.

Example

```
String str = "Count me";  
System.out.println(str.length());
```

24 a) Define String Comparison.

Or

24 b) What is String Comparison?

Answer:

The string class includes several methods that compare strings or substrings within strings. To compare two strings for equality equal() method is used.

Syntax:

```
boolean equals(Object str)
```

25 a) What is the method used for concatenating two strings?

Or

25 b) How will you concatenate two strings.

Answer:

concat() is used for concatenating two strings

Syntax:

```
String concat(String str)
```

Example:

```
String s1="one";  
String s2=s1.concat("two");
```

26 a) What is the method used for removing whitespace?

Or

26 b) How will you remove whitespace.

Answer:

trim() is used to remove whitespaces. It returns a copy of the invoking string from which any leading and trailing whitespace has been removed.

Syntax:

```
String trim()
```