1. Describe the key features of Java. How does Java achieve platform independence

- Java is the most popular object-oriented programming language
- Java has many advanced features, a list of key features known as Java Buzz Words

* Simple:

- Java programming language is very simple and easy to learn, understand and code
- Most of the syntaxes in java follow basic programming language C and object oriented programming concepts are similar to C++

* Secure:

- Java is said to be more secure programming language because it does not have pointers concept
- Java provides a feature "applet" which can be embedded into web application

* Portable:

- Portability is one of the core features of java
- If a program yields the same result on every machine, then that program is called portable
- Java programs are portable

* Object-Oriented:

- Java is an object oriented programming language, this means java programs use objects and classes

* Robust:

- Robust means strong
- Java programs are strong and they don't crash easily like C or C++ programs

* Platform independent

- Java has invented to archive "write once; run anywhere, anytime forever"
- The java provides JVM [Java Virtual Machine] to archive architectural-neutral or platform independent

* Multi- threaded

- Java supports multithreading programming which allows us to write programs that do multiple operations simaltaneously

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2. What is constructor in Java ? Explain it with suitable example

- Constructor in Java is a special member method which will be called automatically by the JVM whenever an object is created for placing user defined values in place of default values

Syntax :

```
ClassName []
{
.....
.....
}
```

* Types of Constructors

Java constructor are classified in two types. They are

i] Default or no-argument Constructor

ii] Parameterized constructor

* Default constructor

- A constructor is said to be default constructor if and only it never takes any parameter
- If any class does not contain atleast one user defined constructor, then the system will create a default constructor which is known as system defined default constructor

Ex:
```
class Test
    {
        int a,b;
        Test []
        {
            a = 10;
            b = 20;

System.out.println("Value of a:"+a];
System.out.println("Value of b:"+b);
                                }
                            }

class TestDemo
    {
        public static void main (String args[])
        {
            Test t1 = new Test[]; }
                                }
```

* Parameterized Constructor

. If any constructor contain list of variables in its signature is known as parameterized constructor. A parameterized constructor is one which takes some parameters

Ex:
```
class Test
{
    int a, b;
    Test (int n1, int n2)
    {
        a = n1;
        b = n2;
    System.out.println ("Value of a = " +a);
    System.out.println ("Value of b = " +b);
    }
}

class TestDemo
{
    public static void main (String args[])
    {
        Test t1 = new Test (10,20);
    }
}
```

4. Define Package. Explain different types of packages and their advantages [Syntax is important]

- A package is a collection of similar types of classes, interfaces and sub-packages

Syntax:

```
import package.name Class; // imports a single class
import package name.*; // imports the whole package
```

Types of Packages

Packages are classified into two types

1. Predefined or Built-in package
2. User defined package

* Predefined or Built in-package

These are the packages which are already designed by Sun Microsystem and supply as a part of Java

Following are the list of pre-defined packages in Java

- java.lang : This package provides the language basics
- java.util : This package provides classes and interfaces [API's] related to collection frame work, events, data structure etc
- java.io : This package provides classes and interfaces for file operation and other input and output operations
- java..awt : This package provides classes and interfaces to create GUI components in Java
- java.time : The main API for dates, times, instant and durations

* User defined package

- If any is designed by user, it is known as user defined package
- User defined package are those which are developed by java programmer and supply as part of their project to deal with common requirement

6a] What does the new keyword do in Java?

- The new keyword in Java is a crucial operator primarily used for object creation and dynamic memory allocation It performs several key functions.

Ex: Student s = new Student();

6b] Can a class extend multiple interfaces

- Yes, in Java a class can ~~implement~~ (extend) multiple interfaces, allowing multiple inheritance of type

Ex: class Demo implements A, B {}

6c] What is an exception in Java

- An exception in Java is an unwanted event or error that occurs during program execution, disrupting the normal flow of instructions.