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8th Batch (CSE - Evening)

Sub: Object Oriented Programming

C.Code: CSI - 211

(a)

Ans: to the Q: No: 1 - (a)

Ans: Polymorphism: In object-oriented programming, polymorphism (From the Greek meaning "having Multiple forms") is the characteristic of being able to assign a different meaning or use to something's in different contexts - specifically, to allow an entity such as a variable, a function or an object to have more than one form. There are several different kind of polymorphism.

\* Andrew Cooke's "An Introduction to programming Languages" - mention polymorphism.

\* Peter Muller's "An Introduction to object-oriented programming using C++" Also discusses polymorphism.

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\*(b) Ans: Class in Java:

Class are a Blueprint or a set of instruction to built a specific type of object-oriented programming which revolve around the real-life Entities class in Java Determines how an object will behave and what the object will contain.

→ Syntax of class in java:

```
Class <class_name> {  
    field;  
    method;  
}
```

Object in java: Object is an instance of a class. An object in oops- is nothing but a self-contained component which consists of method and properties to make a particular type of data useful. For example colour name table, dog, barking. When you send a message to an object, you are asking the object to invoke or execute one of its methods as defined in the class.

From a programming point of view, an object in oops can include a data structure, a variable, or a function. It has a memory location allocated. Java objects are designed as class hierarchies.

→ Object syntax in java:

```
class Name Reference variable = new class  
Name();
```



## (C) Ans: Benefit of object oriented programming:

- \* Oop models complex things as reproducible, simple structures.
- \* Reusable, oop object can be used across programmes.
- \* Allows for class-specific behavior through polymorphism.
- \* Easier to debug, classes often contain all applicable information to them.
- \* Secure, protects information through encapsulation.
- \* Abstraction: by using classes, you are able to generalize your object types. Simplifying your programme.
- \* Inheritance: Because a class can inherit attributes and behavior from another class, you are able to reuse more code.
- \* Polymorphism: One class can be used to create many objects all from the same flexible piece of code.
- \* Encapsulation: in oop bundle code into a single unit where you can determine the scope of each piece of data.



Ans: to the: 8: NO: 2 (a)

\* (a) Ans: Java Applets:

Applet is special type of programme that is embedded in the webpage to generate the dynamic content.

It Runs inside the Browser and works at client side.

\* It work at client so less response time.

\* secured.

\* It can be executed by browser running under many platforms including linux, windows, Mac, OS, etc.

\* (b) Ans: Applications that run on Java:

1. Desktop GUI Applications.

2. Mobile Application.

3. Enterprise Application.

4. scientific Application.

5. web-based Application.

6. Embedded systems.

7. Big data technologies.

8. Distributed Application.

9. cloud-based Application.

10. software tools.

11. Gaming Application.



\* Desktop GUI Application: Desktop Application can be easily developed using Java. We use APIs like AWT, Swing, Java fbx to build the Application.

\* Mobile Application: A mobile application is a application created for mobile phones and tables. In today's era, the majority of phones and smart device have android OS and android development is not possible without Java.

\* Enterprise Application Java: An enterprise application is a large software system which operates in corporate environment to satisfy the needs of an Organization, rather than of individual users.

\* Scientific Application: A scientific Application is an Application that affects real-world activities using mathematics.

Java support the development of scientific Application because of its powerfull features.



Web Based Application: A web application is a client server program that is delivered on the internet through a browser interface. Java supports the development of web-application with the help of servlets, struts JSP/JSF

Embedded system: An embedded system also known as an integrated system is a combination of many small computing units that assemble together to perform dedicated function for the larger system.

Big data technologies: The term big data is defined as extremely large and complex data set that may be analyzed to extract patterns, trends, and useful information. It is one of the most popular topics in the world of the latest technology.

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~~\*\*\*~~ (c) Multithreading: In Java, multithreading refers to a process of executing two or more threads simultaneously for maximum utilization of the CPU.

A thread in Java is a lightweight process requiring fewer resources to create a shared process resource.

\* Advantage of a multithreading: → Improve performance and concurrency for certain application by using multithreading and multicontexting together. In other application performance can be unaffected or even degraded by using that together. How performance is affected depends on your application.

\* simplified coding of remote procedure call/  
\* Reduced number of required servers. <sup>conversation.</sup>

~~\*\*\*~~ Dis Advantage of multithreading:

\* Difficulty of writing code.

\* Difficulty of debugging.

\* Difficulty of testing.

\* Difficulty of proving existing.

\* Difficulty of meaning concurrency.



Ans: JAVA RMI: Remote method invocation (RMI) allow a java object to invoke method on a object running on another machines. RMI Provide remote communication between java program. RMI is used for Building Distributed application.

→ Stub and skeleton between difference:

Stub	skeleton
1. A connection is established using Remote virtual machine.	1. All the paramiters are read for the remote method.
2. It then transmit the paramiters to the Remote virtual machine. This is also know As Marshals.	2. The method is invoked on the remot object.
3. After the 2nd step, it then wits for the output.	3. It then wait and transmits the paramiter for the result. This is also known as marshals.
4. Now it read the value or exception wich is come as on output.	4. In RMI, a skeleton is an object that is used as a gateway for the Server-side.
5. At last, it requary the value to the client.	All the incoming request are sent throughtit. when a server invokes the method on the skeleton object following thing are performed, internally.



Ans: to the Q: NO: 03 (a)

Ans: Java servlets; Servlets technology is robust and scalable because of Java language. Before servlet, CGI (Common gateway interface) scripting language was common as a server-side programming language. However, there were many disadvantages of this technology. We have discussed these disadvantages below. There are many interfaces and classes in the servlet API such as `Servlet`, `GenericServlet`, `HttpServlet`, `ServletRequest`, `ServletResponse` etc.

### \* Disadvantage of servlet:

1. If the number of clients increases, it takes more time for sending the response.
2. For request, it starts a process, and the web server is LTD to start process.
3. It uses platform dependent language. C++, Perl.

### \* Advantage of servlet:

1. Better performance: Because it creates a thread for each, not process.
2. Portability: Because it uses Java language.
3. Robust: JVM manages servlets, so we don't need to worry about their memory leaks, garbage collection, etc.
4. Secure: Because it uses Java language.



Ans. to: Que. No. 03(b)

Ans: Program:

```
import java.util.Scanner;  
public class Evenodd {  
    public static void main (String [] args) {  
        Scanner reader = new Scanner (System.in);  
        System.out.print ("Enter a number:");  
        int num = reader.nextInt ();  
        if (num % 2 == 0)  
            System.out.println (num + " is even");  
        else System.out.println (num + " is odd");  
    }  
}
```

Output

Enter a number: 12

12 is even