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subject:- object-
oriented program
Program:- BScs
Final assignment
Semester 2

Question:-1

Why access modifiers are used in java, explain in detail private and Default?

Access modifier used in java:-

A java access modifiers specifies which classes can access a given class and its field, constructor and methods. Access modifiers can be specified separately for a class, its con-

Constructors, field and method.

Private:-

The access level of a private modifiers is only within the class. It cannot be accessed from outside the class.

Default:-

The access level of a default modifier is only within the package. It cannot be accessed from outside the package. If you do not specify any access level, it will be the default.

Access modifiers	Private	Default
within class	Yes	Yes
within package	No	Yes
outside package by subclass only	No	No
outside package	No	No

Q1. b Part

write a specific program of the above mentioned access modifiers in java.

Private access modifier Programming:-

class name

```
private double num = 100;
```

```
private int square(int a){
```

```
    return a*a;
```

```
}
```

```
}
```

```
public class Example {
```

```
    public static void main(String  
    args[])
```

```
    name obj = new name ();
```

```
    System.out.println (obj.num);
```

```
    System.out.println (obj.square (10)
```

```
}
```

```
}
```

Default access modifiers Programming

```
Public class Addition {  
    int addTwoNumbers ( int a,  
    int b ) {  
        return a + b;  
    }  
}
```

```
Public class Test {  
    Public static void main  
    (String args []) {  
        Addition obj = new Addition();  
        obj.addTwoNumbers (10, 21);  
    }  
}
```

Question:- 2

Explain in detail Public and protect access modifier?

Public access modifier:-

A class, method, constructor, interface, etc. declared public can be accessed from any other class. Therefore field, method, block declared inside a public class can be accessed from any class belonging to the java universe.

However, if the public class we are trying to access is in different package, then the public class still needs to be imported. Because of class inheritance,

all public methods and variable of a class are inherited by its subclasses.

Examples-

```
public static void main(String[]  
    //.....  
}
```

Protect access modifiers-

variable, method and constructors, which are declare protected in a Super class can be accessed only by the subclasses in other Package or any class within the package of the protect members class.

The protect class modifier cannot be applied to class and inheritance. methods, fields can be declared Protect, however method and fields

in a interface cannot be declared protected.

Protect access gives the subclass a chance to use the helper method or variable. while preventing a nonrelated class from trying to use it.

Example:-

```
class Audioplayer {  
    protected boolean openspeaker;  
    // implement details  
}  
}
```

```
class StreamingAudioplayer extends Audioplayer {  
    boolean openspeaker (Speaker sp)  
    // implementation details  
}  
}
```

Q2. Part b

write a specific program of the above mentioned access modifiers in java.

Public access modifiers Programming

```
public class Addition {  
    public int addTwoNumbers(int a,  
        int b)  
        return a+b;  
}
```

```
}  
class Test {  
    public static void main (String  
        args [])  
        Addition obj = new Addition();  
        System.out.println (obj.addTwo-  
            umbers (100, 1);  
}
```

```
}
```


~~Protect~~ access modifiers programming

```
Public class Addition {  
    int addTwoNumbers (int a,  
    int b) {  
        return a+b;  
    }  
}
```

```
Public class Test {  
    Public static void main (String  
    args []) {  
        Addition obj = new Addition();  
        obj.addTwoNumbers (10, 21);  
    }  
}
```

Question:-3

what is inheritance and why it is used, discuss in detail?

Inheritance in Java

Inheritance is an important pillar of oop (Object oriented programming). It is the mechanism in Java by which one class is allowed to inherit the features (field and methods) of another class. The subclass can add its own field and methods in addition to the superclass field and methods.

Inheritance is a process of defining a new class based on an existing class by extending its common data members and methods. Inheritance allow us to reuse

of code, it improves reusability in your java application.

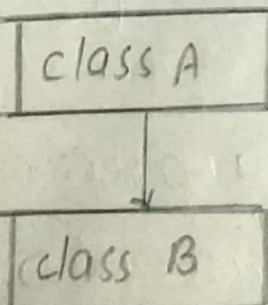
Inheritance is a mechanism in which one class acquires the property of another class.

For example, a child inherits the traits of his/her parent.

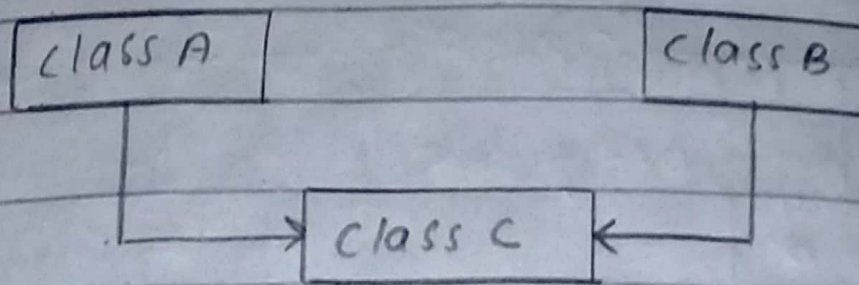
With inheritance, we can reuse the field and methods of the existing class. Hence, inheritance facilitates Reusability and is an important concept of oops.

Types of Inheritance

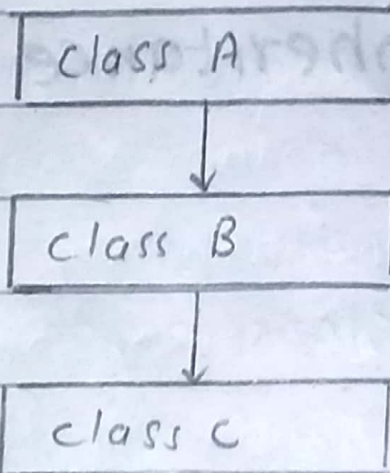
Single class:-



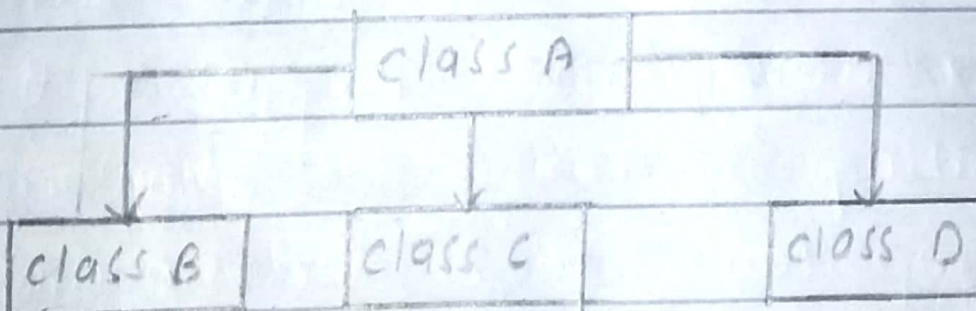
Multiple Inheritance:-



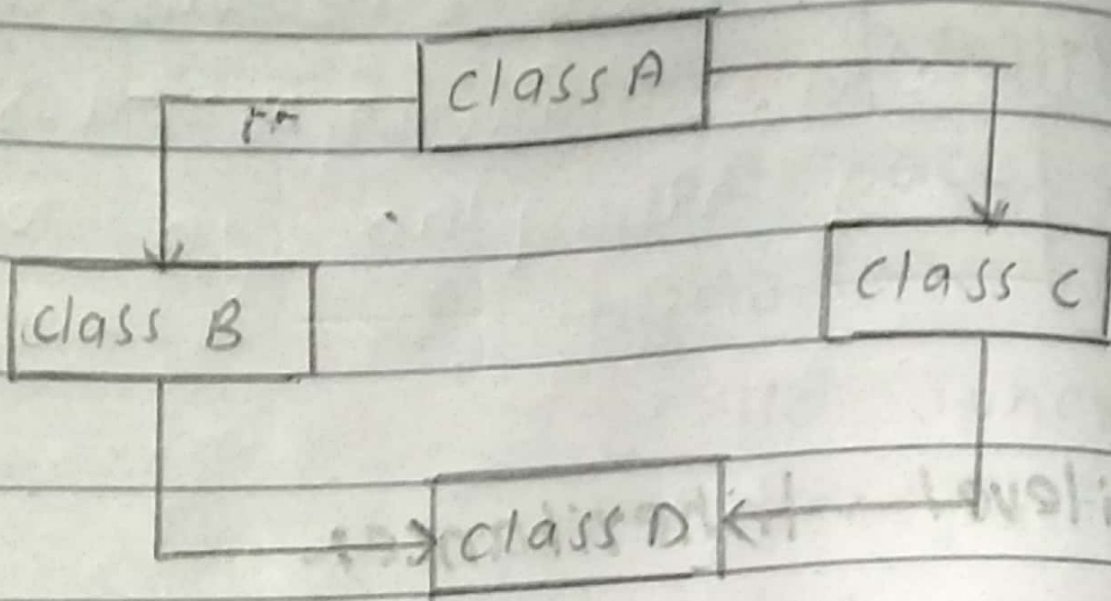
Multi level Inheritance:-



Hierarchical inheritance:-



Hybrid inheritance:-



Java inheritance Syntax:-

```
class SubClass extend SuperClass  
{  
    // method and data  
}
```

Q3. Part b

write a program using inheritance class on Animal in Java.

```
Public class AnimalInheritance Test {  
    Public Static void main (String[] args){  
        Cat cat = new cat ("false", "milk", 4, "black");  
        System.out.println ("cat is vegetarian?"  
            + cat.isVegetarian());  
        System.out.println ("cat eats" + cat.get  
            Eats());  
        System.out.println ("cat has" + cat.get  
            NumberOfLegs()); + "legs.");  
        System.out.println ("cat color is" +  
            cat.getColor());  
    }  
}
```

Question:- 4

What is polymorphism and why it is used, discuss in detail?

Polymorphism:-

In object-oriented programming refers to a programming language ability to process objects differently depending on their data type or class. More specifically, it is the ability to redefine method for derived class.

Polymorphism is the ability of an object to take on many form. The most common used of polymorphism in oop occurs when a parent class reference is used to refer to a child class object.

Any java object that can pass

more than one IS-A test is considered to be polymorphic. A reference variable can be of only one part.

Example:-

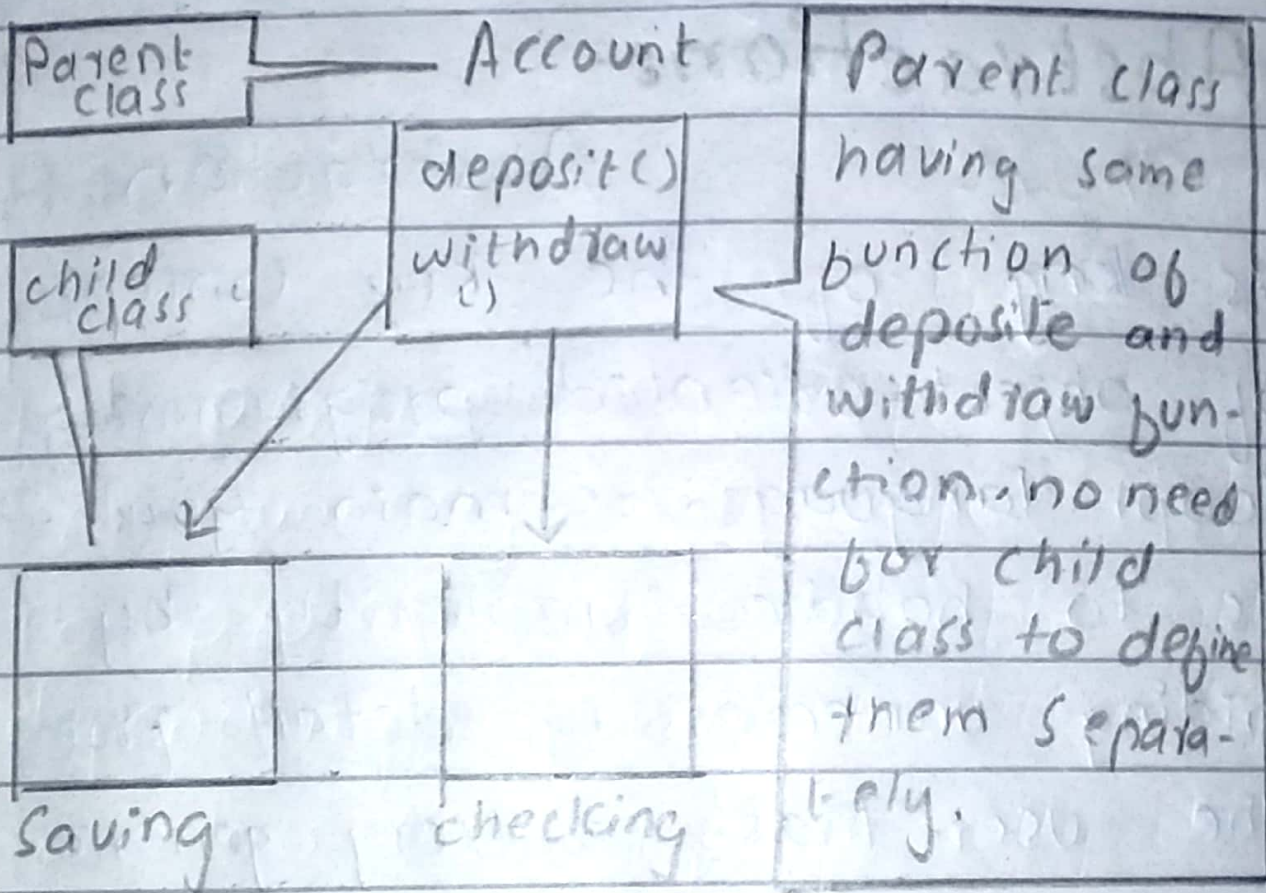
```
Public interface Vegetarian {}  
Public class Animals {}  
Public class Deer extends Animal
```

Why we use Polymorphism:-

The good reason for why Polymorphism is needed in Java is because the concept is extensively used in implementing inheritance. It plays an important role in allowing objects having different internal structures to share the same external interface. Polymorphism as stated clear

by itself, a one which mapped
for many.

Example:-



Qu. Part b

write a program using polymorphism in a class on Employee in java.

```
Public class Employee {  
    Private String name;  
    Private String address;  
    Private int number;  
    Public Employee (String name,  
    String address, int number) {  
        System.out.println ("Constructing an Employee");  
        this.name = name;  
        this.address = address;  
        this.number = number;  
    }  
    Public void mailcheck () {  
        System.out.println ("mailing a check to" + this.name +  
        " " + this.address);  
    }  
}
```

```
Public String toString () {  
    return name + " " + address  
    + " " + number;  
}
```

```
Public String getName () {  
    return name;  
}
```

```
Public String getAddress () {  
    return address;  
}
```

```
Public void setAddress (String  
newAddress) {  
    address = newAddress;  
}
```

```
Public int getNumber () {  
    return number;  
}
```

3

Question:-5

Why abstraction is used OOP, discuss in detail?

Abstraction:-

Abstraction is one of the key concepts of object-oriented programming (OOP) language. Its main goal is to handle complexity by hiding unnecessary detail from the user. That's a very generic concept that's not limited to object-oriented programming. You can find it everywhere in the real world.

Abstraction important in programming:-

Abstraction is one of the key element of good software design. It help enc-

absolute behavior. It help decouple software elements. when developing with higher level of abstraction. you communicate the behavior less the implementation.

Abstraction example:-

Examples of abstraction can be feelings such as Sadness or happiness. Abstraction is define as work of art where the subject or theme is implied. An example of an abstraction that is a piece of art is the painting "Invasion" by Marten Jansen.

Abstract class in java:-

An abstract class must be declared with an abstract keyword.

- It can abstract and non-abstract methods.

- It cannot be instantiated.
- It can have constructor and static methods also
- It can have final methods which will force the subclass not to change the method.

Q5. Part b

write a program on
abstraction in java.

```
abstract class A {  
    abstract void msg();  
}  
class B extends A  
{  
    void msg() {  
        System.out.println("My name  
is");  
    }  
    public static void main (String  
args) {  
        B = new B();  
        b.msg();  
    }  
}
```