28 Lecture - CS201

Important Subjective

1. **What is the purpose of encapsulation in object-oriented programming? Provide an example.**

Answer: Encapsulation is the practice of hiding implementation details from the user and providing a clean and consistent interface for working with the object. This helps in preventing accidental modification of object state and makes it easier to change the implementation details without affecting the code that uses the object. An example of encapsulation can be a bank account class, where the balance variable is hidden from the user and can only be accessed through methods such as deposit and withdraw.

2. **What is inheritance in object-oriented programming? Give an example.**

Answer: Inheritance is the ability to create a new class by extending an existing class. The new class inherits all the properties and methods of the existing class and can add its own properties and methods as well. An example of inheritance can be a vehicle class that has properties such as color and number of wheels. A car class can then be created by inheriting from the vehicle class and adding its own properties such as model and engine type.

3. **What is polymorphism in object-oriented programming? Give an example.**

Answer: Polymorphism is the ability of objects of different classes to be used interchangeably in the same context. This is achieved through method overriding and method overloading. An example of polymorphism can be a shape class that has a draw method. The class can have subclasses such as circle, rectangle, and triangle that inherit from the shape class and implement their own draw method that is specific to their shape.

4. **What is the difference between a class and an object in object-oriented programming?**

Answer: A class is a blueprint for creating objects that define the properties and methods that objects of that class will have. An object, on the other hand, is an instance of a class that has specific values for its properties and can invoke its methods.

5. **What is the purpose of a constructor in a class?**

Answer: A constructor is a special method in a class that is used to initialize the object's properties when it is created. It is called automatically when the object is instantiated and can be used to set default values for properties or to perform any other initialization tasks.

6. **What is the difference between public, private, and protected access modifiers in a class?**

Answer: Public access modifier allows properties and methods to be accessed from anywhere, Private access modifier restricts properties and methods to be accessed only within the same

class, and Protected access modifier allows properties and methods to be accessed only within the same class and its subclasses.

7. **What is method overloading in object-oriented programming? Give an example.**

Answer: Method overloading is the ability to define multiple methods with the same name but different parameters in a class. This allows the same method name to be used for similar tasks that may have different input parameters. An example of method overloading can be a calculator class that has two methods with the same name add, but one takes two integer parameters and the other takes two double parameters.

8. **What is method overriding in object-oriented programming? Give an example.**

Answer: Method overriding is the ability of a subclass to provide its own implementation of a method that is already defined in its superclass. This allows the subclass to modify the behavior of the inherited method. An example of method overriding can be a vehicle class that has a start method. A car subclass can then override the start method to add additional functionality specific to the car.

9. **What is abstraction in object-oriented programming? Give an example.**

Answer: Abstraction is the practice of hiding implementation details from the user and providing a simplified view of the object. This is achieved by exposing only the necessary information and hiding the implementation details. An example of abstraction can be a shape class that has a method called getArea, which returns the area of the shape.