

JK LAKSHMIPAT UNIVERSITY, JAIPUR

INSTITUTE OF ENGINEERING AND TECHNOLOGY

End Term Examination April 2024

B.Tech. Semester II Backlog

CS1101: Object Oriented Programming

Roll No.....

Time: 3 hours

Max. Marks: 75

Instructions to students:

1. Do not write anything other than your roll number on question paper.
2. Assume suitable data wherever required and mention it clearly.

Q.1	Find the output of below given JAVA code. If the given code is incorrect, then what is wrong with the following code? How would you fix it? <pre>public class Test { public static void main (String[] args) { A a = new A(); a.print(); } } class A { String s; A(String oop) { s = oop; } public void print() { System.out.print(s); } }</pre>	05 [LO1]
Q. 2	You want subclasses in any package to have access to members of a superclass. Which of the following is the most restrictive access that accomplishes this objective? - public, private, protected and default - explain why?	05 [LO1]
Q. 3	Create an interface TVremote having methods Samsung_remote and LG_remote and use it to inherit another interface smart_TVremote having method TV_on and TV_off Create a class TV_OOP which implements TVremote interface from.	05 [LO2]
Q. 4	Write Java Program to Find the Tranpose of Matrix	05 [LO2]

Q. 5	Given a string, take the last char and return a new string with the last char added at the front and back, so "cat" yields "tcatt". The original string length must be 1 or more. <code>backAround("cat") → "tcatt"</code> <code>backAround("Hello") → "oHello"</code> <code>backAround("a") → "aaa"</code> .	05 [LO3]
Q. 6	Write a java program to design an abstract class named <code>electricCharges</code> that contains the following data members String <code>consumerType</code> – namely domestic, institutional and commercial Int <code>Units</code> – input amount of units consumed With an abstract method <code>void getRate()</code> and <code>amount()</code> ; Design a subclass namely <code>billGeneration</code> that extends the abstract class to override necessary methods – to take input of the consumertype, based on which it gets the rate and no of units consumed and accordingly generates the bill using the following formula If <code>units < 100</code> discount 20% If <code>units < 200</code> but <code>> 100</code> discount 10% If <code>units > 200</code> no discount. Use a class <code>testBill</code> to check application of the above classes.	10 [LO3]
Q. 7	Write a <i>Patient</i> class which inherits from the <i>Person</i> class. You may also need to use the <i>Money</i> class. The <i>Patient</i> class requires the following: • a variable to store the patient number for the patient. • a variable to store the hospital. • a variable to store the patient's year of joining the hospital. • a variable to store the patient's address. • a variable to store the medical fees that the patient pays. • constructor, which initializes the variables. • methods to set the year of joining and address. • methods to get the year of joining and address. • a method to calculate the medical fees: It should take a <i>Money</i> object (the basic fee per year) as a parameter and use it to return the basic fee for the patient. A patient should pay the basic fee for the year of Rs 1200, and Rs 50 as tax. a <code>toString</code> method.	10 [LO4]
Q. 8	Write a Java program that will accept an integer and convert it into a binary representation. Now count the number of bits which is equal to zero of the said binary representation. For example, 17 in binary is 10001 so count is 3 as binary value has 3 zeros.	10 [LO4]

Q. 9	Create a class named 'Rectangle' with two data members 'length' and 'breadth' and two methods to print the area and perimeter of the rectangle respectively. Its constructor having parameters for length and breadth is used to initialize length and breadth of the rectangle. Let class 'Square' inherit the 'Rectangle' class with its constructor having a parameter for its side (suppose s) calling the constructor of its parent class as 'super(s,s)'. Print the area and perimeter of a rectangle and a square.	10 [LO5]
Q. 10	Consider a scenario where you are building a system to model different types of vehicles. You need to define a Java class hierarchy to represent different types of vehicles such as cars, motorcycles, and bicycles. Each vehicle has common properties such as make, model, and year, as well as specific properties and behaviors unique to each type of vehicle. Design an abstract class called "Vehicle" that has the following abstract methods: void accelerate (): This method should be implemented by concrete classes (e.g., Car, Motorcycle, Bicycle) to define how each type of vehicle accelerates. void brake (): This method should be implemented by concrete classes to define how each type of vehicle brakes. The "Vehicle" class should also have the following properties: String make: Represents the make of the vehicle. String model: This represents the model of the vehicle. int year: Represents the year of the vehicle. In addition to the "Vehicle" abstract class, define an interface called "Convertible" that has the following method: void openRoof(): This method should be implemented by any vehicle that is convertible (e.g., cars) to define how the roof is opened. Finally, create concrete classes for "Car", "Motorcycle", and "Bicycle" that inherit from the "Vehicle" abstract class and implement the "accelerate" and "brake" methods. The "Car" class should also implement the "Convertible" interface and provide an implementation for the "openRoof" method.	10 [LO5]

*****All the Best*****

