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B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

August 2024 Semester End Main Examinations

Programme: B.E. **Semester: IV**
Branch: Information Science and Engineering **Duration: 3 hrs.**
Course Code: 23IS4PCJAV **Max Marks: 100**
Course: Java Programming

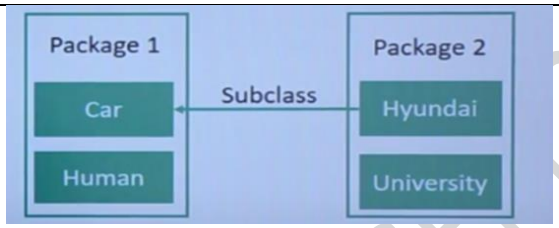
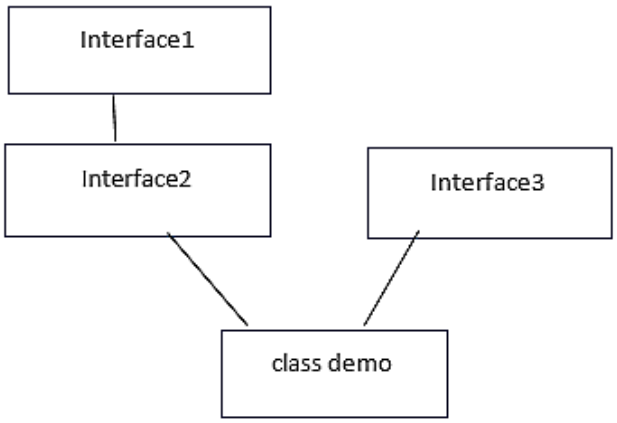
Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

Important Note: Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.

			UNIT - I	CO	PO	Marks
1	a)		Design a program to count the number of circles created using a static variable.	CO2	PO1	5
	b)		What are class methods? Illustrate with a code snippet.	CO2	PO1	5
	c)		Create a class Employee with appropriate fields for employee name, employee id and Vehicle id. Create at least three Employee objects and invoke appropriate methods. Demonstrate the usage of three different types of constructors for the Employee class.	CO2	PO1	10
			UNIT - II			
2	a)		Create an abstract class Area with an abstract method. Class Rectangle and Circle inherits class Area to find the area. Write the main method by creating objects of the classes.	CO2	PO1	5

	b)		How run time polymorphism is supported in Java?
			Analyze the program and predict output for the code given below.
			class Car {
			public void run() {
			System.out.println("Car running");
			}
			}
			class Maruti extends Car {
			
			public void run() {
			System.out.println("Maruti running...");
			}
			}
			class Hundai extends Car {
			public void run() {
			System.out.println("Hundai running...");
			}
			}
			class Driving {
			public void drive(Car c) {
			c.run();
			}
				CO2	PO2	10

			}
			public class Sample {
			public static void main(String[] args) {
			Driving d = new Driving();
			Car m = new Maruti();
			d.drive(m);
			Car h = new Hundai();
			d.drive(h);
			}
			}			

		c)	Distinguish between Class and Interface. Illustrate with an example.	*CO1*	*PO1*	**5**
			OR			
	3	a)	Design an interface Number which has a method findSquare(n) for any positive number n.	*CO2*	*PO1*	**5**
		b)	 For the given model, you have two classes Car and Human in Package1 and Hyundai and University in Package2. Each class have member variables and methods defined inside. Show all the access modifiers for these classes in a tabular form by specifying 'Yes' or 'No'(whether you an access or not access).	*CO2*	*PO1*	**5**
		c)	Implement the relationship in the given below diagram by invoking methods in all the interfaces and methods in demo class. Discuss the type of inheritance. 	*CO2*	*PO1*	**10**
			UNIT - III			
	4	a)	Create a base class called Father and derived class called Son which extends the base class. In Father's class, implement a constructor which takes the age and throws the user defined exception WrongAge( ) when the input age<0. In Son's class, implement a constructor that checks both father's and son's age and throws an using defined exception AgeInvalid( ) if son's age is >=father's age.	*CO3*	*PO1*	**10**

		b)	**Predict the output of the given program, if any error in the code, correct the errors or add additional code snippets. Justify your answer.**
			i)
			public class MultiThreading {
			private static class MyThread implements Runnable {
			public MyThread(String name) {
			super(name);
			}
			@Override
			public void run() {
			System.out.println(Thread.currentThread().getName());
			}
			}
			public static void main(String[] args) {
			MyThread myThread = new MyThread("myThread");
			myThread.run();
			}
			}
				CO3	***PO2***	**5**

		c)	Implement a class that checks whether a given number is a prime using both the Thread class and Runnable interface.	***CO3***	***PO2***	**5**
			OR			

	5	a)	Complete the code given below and identify the type of exception in the given code, Justify.
			class Identify
			{
			public static void main(String args[])
			{
			try {
			String a = "I love BMSCE";
			char c = a.charAt(14);
			System.out.println(c);
			}
			catch(----------e) {
			System.out.println("----------");
			} } }
				CO2	***PO2***	**3**

		b)	Illustrate the difference between throw and throws keyword with a small program.	***CO3***	***PO2***	**10**
		c)	Consider a Bus reservation system that allows online reservations to its customers. Suppose there are two transactions of reservation for a particular seat simultaneously which leads to race condition. Develop a solution to avoid the unpredictable situation with a program.	***CO3***	***PO2***	**7**
			UNIT - IV			
	6	a)	Create a class called Customer with member variables cid, name and item. Write a customer manager program to write and read the customer information from file by using FileInputStream and FileOutputStream. Also handle the exception if the file does not exist.	***CO2***	***PO1***	**10**

		b)	i)String str=”ENGINEERING” String s= new String(“ENGINEERING”); **Differentiate with the above two statements.** ii)**String s=new String(“hello”);** How many memory locations are allocated when this statement is executed. Justify your answer.	***CO3***	***PO2***	**5**
		c)	Implement a program to extract a portion of a character string and print the extracted string. Assume that m characters are extracted, string starting with the nth character.	***CO3***	***PO2***	**5**
			UNIT - V			
	7	a)	Implement a general class which can be used to work on any type of data.	***CO3***	***PO2***	**5**
		b)	Create a class STUDENT with two private string members: USN, Name using ArrayList class in Java. Write a program to add atleast 3 objects of the above STUDENT class. Also display the data in neat format.	***CO3***	***PO2***	**5**
		c)	Identify which collection framework is best suited for search operation by giving the collection framework hierarchy. Justify your answer.	***CO2***	***PO1***	**10**

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