Roll No. : ……

Bharati Vidyapeeth's
Institute of Computer Applications and Management (BVICAM)
A-4, Paschim Vihar, New Delhi-63
FIRST SEMESTER [MCA] Internal Examination, November 2023

Paper Code: MCA 109	**Subject: Object Oriented Programming with Java**
Time: 2 Hours	**Maximum Marks: 45**

Note: Attempt THREE questions in all. Question No. 1 is compulsory, and attempt one question from each unit.

1. Answer all the following questions briefly: - 1.5 × 10 = 15

(a) CO1

Employee
-id: int -firstName: String -lastName:String -salary:int
+Employee(id:int, firstName: String, lastName:string, salary:int)

A class called Employee, which models an employee with an ID, name and salary, is shown above. Write the code snippet for the employee class.

(b) Contrast between-: CO2

ArrayList <Integer>al = new ArrayList<Integer>( ); and

List<Integer> all= new ArrayList<Integer>( );

(c) "In order for Java programs to be safely downloaded and executed on the client computer, it was necessary to prevent them from launching such any malicious attack". Justify how Java achieved this protection. CO1

(d) byte b = 50; b = b * 2; Will this code compile correctly? Explain your answer. CO1

(e) Identify the types permitted inside a switch block. CO1

(f) Distinguish between error and exception. CO2

(g) How can asynchronous behavior of threads be overcome? Elaborate. CO2

(h) String s1= "Hello"; String s2= "Hello"; String s3= "HELLO"; CO2
Demonstrate the difference between equals() and equalsIgnoreCase() in the above objects.

(i) Elaborate the difference between final and finally through suitable example. CO2

(j) Demonstrate the different states a thread can be in during its life cycle. CO2

UNIT - I

2. (a) Design a class called **Circle** with following components: 5 CO1

i. Two private instance variables: radius (of the type double) and color (of the type String), with default value of 1.0 and "red", respectively.

ii. Two *overloaded* constructors - a *default* constructor with no argument, and a constructor which takes a "double" argument for radius.

iii. Two public methods: getRadius() and getArea(), which return the radius and area of this instance, respectively. Write a *test program* called TestCircle which uses the Circle class.

	(b)	Write a program to generate the following output: 0 12 345 6789	5	CO1
	(c)	A class *Computer* has a method *void identify* () that identifies the type of computer. *Computer* is sub-classed into *Laptop* and *Desktop*. Using a single reference, display the different types of computers. Hint: Create an instance of each type.	5	CO1
3.	(a)	A class called *MyPoint*, which models a 2D point with x and y coordinates. It contains: • Two instance variables x (int) and y (int). • A default constructor that constructs a point at the default location of (0, 0). An overloaded constructor that constructs a point with the given x and y coordinates. • A method *setXY*() to set both x and y. • A method *getXY*() which returns the x and y in a 2-element integer array. • A method *toString*() that returns a string description of the instance in the format "(*x*, *y*)". • A method *distance (int x, int y)* that returns the distance from *this* point to another point at the given (x, y) coordinates. Write the code for the class MyPoint. Also write a test program (called TestMyPoint) to test all the methods defined in the class.	5	CO1
	(b)	Design a *Shape* class and two subclasses: *Circle* and *Rectangle*. Each subclass overrides the draw () method inherited from the Shape class. Demonstrate dynamic binding in the same.	5	CO1
	(c)	With an appropriate example, demonstrate the different uses of *final* keyword in Java.	5	CO1

UNIT – II

4.	(a)	A Coach wishes to create a program that lists his players sorted by the number of matches they have completed. The listing should be greatest number of matches first, sub-sorted by playerid? Use appropriate data structure to store and sort this data. *HINT- A class PlayerInfo stores the playerid and number of matches completed for a player*.	5	CO2
	(b)	Create a class PalindromesViaThreads that prints the 20 palindrome numbers (222, 232, 333) between 200 and 2000 using Threads.	5	CO2
	(c)	Construct a connection-less Timeserver application that sends system date and time in the format requested by the client. a) Client: Reads a string representing the required format from the end- user. b) Server: Returns the system date and time in the requested format or a default format if received format is not understandable. c) Client: Display the returned contents	5	CO2
5.	(a)	Create a list to store the student names admitted in MCA. Remove all 4 letter student names from the list and also avoid duplicate student names. Provide mechanism to display the contents of the list.	5	CO2

(b)	Write a program called ReverseHello that creates a thread (let's call it Thread 1). Thread 1 creates another thread (Thread 2); Thread 2 creates Thread 3; and so on, up to Thread 50. Each thread should print "Hello from Thread !", but you should structure your program such that the threads print their greetings in reverse order	5	CO2
(c)	Create a connection-oriented client/server application using TCP/IP protocol where the client has the following responsibilities: a) Server: Creates an Employee Class having fields- employeeName, employeeID and department. Server holds an array of employee objects. b) Client: Accept the employeeID of an employee as an integer from the user. c) Server: Searches for corresponding employee object, in the array and write its details to the client stream. d) Client: Display the received object's information.	5	CO2