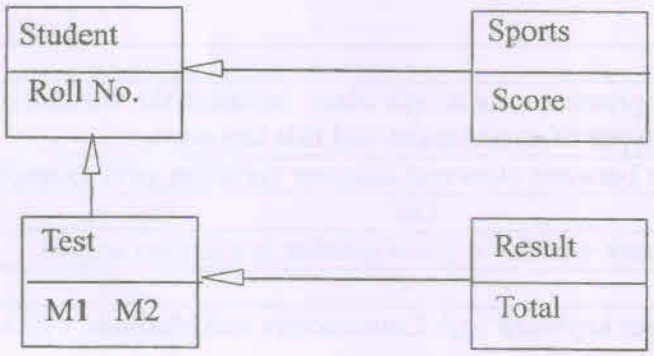
26·12·2022 (E)

SOMAIYA VIDYAVIHAR UNIVERSITY

Semester: August 2022 – December 2022		
Maximum Marks: 100 **Examination: ESE Examination**		**Duration:3 Hrs.**
Programme code: 01 **Programme:** B.Tech	**Class:** SY	**Semester:** III **(SVU 2020)**
Name of the Constituent College: **K. J. Somaiya College of Engineering**	**Name of the department: COMP**	
Course Code:116U01C304	**Name of the Course: Object Oriented Programming Methodology**	
Instructions: 1)Draw neat diagrams 2) All questions are compulsory **3) Assume suitable data wherever necessary**		

Que. No.	Question	Max. Marks
Q1	Solve any **Four**	**20**
i)	Explain the features of Object Oriented Programming.	5
ii)	Explain the difference between class and object.	5
iii)	Explain how String class differs from StringBuffer and StringBuilder classes.	5
iv)	Explain how multiple inheritance can be implemented in Java.	5
v)	Explain Association relationship between classes with the help of an example.	5
vi)	Explain the various levels of access protection available for packages.	5
Q2 A	Solve the following	**10**
i)	Write a program to implement a Rectangle class. Initialize the variables length and breadth using all types of constructors and **this** keyword.	5
ii)	Explain the difference between class and instance variables with examples.	5
	OR	
Q2 A	Write a program to check whether a given number is a perfect square.	10
Q2 B	Solve any **One**	**10**
i)	Explain the use of super keyword with Constructors and Methods with help of example.	10
ii)	Create a Java Class "Shape" with a constructor to initialize a variable "dimension". Create three subclasses of Shape with the following methods: 1. "Circle" with methods to calculate the area and circumference of the circle with dimension as radius. 2. "Square" with methods to calculate the area and length of diagonal of the square with dimension as length of one side. 3. "Sphere" with methods to calculate the volume and surface area of the sphere with dimension as radius of the sphere. 4. Write an appropriate main method to create objects of each class and test every method.	10
Q3	Solve any **Two**	**20**
i)	Explain the lifecycle of a thread.	10
ii)	Create a user defined exception subclass called wrongDateException that is thrown when the date entered by the user is not within permissible range. The permissible range is defined as dd 1 to 31, mm 1 to 12 and yy >=2000 and	10

	<=2022. Write the necessary constructors and override tostring method to display an appropriate message for the exception.	
iii)	Write an interface called "Calculator" that has: 1. Methods for finding the sum, difference, product and remainder of two integer values 2. Write a class that implements this interface	10
Q4	Solve any **Two**	**20**
i)	Distinguish between Abstract Class and Interface.	10
ii)	Create an abstract class with: 1. A constructor which prints "This is constructor of abstract class" 2. An abstract method named a_method 3. A non-abstract method which prints "This is a normal method of abstract class" 4. Class "SubClass" inherits the abstract class and has a method a_method which prints "This is an abstract method" 5. Create an object of SubClass and call the abstract and non-abstract methods	10
iii)	An education institution wishes to maintain a database of its students. The database is divided into a number of classes, whose relationships are shown below. The figure also shows the minimum information required for each class. Specify all the classes and define methods to create the database and retrieve individual information as and when required.  	10
Q5	Write short notes on any **four**	**20**
i)	Static and Dynamic Binding	5
ii)	Static and non-static methods	5
iii)	Collection Framework in Java	5
iv)	Types of inheritance	5
v)	Aggregation and Composition relationships in Class Diagrams	5
vi)	Exception handling mechanism	5