Subject: Object Oriented Programming Methodology (OOPM)
Term: ODD(2024-2025) **Class/Semester:** SY/III

Course Outcome	After successful completion of the course students should be able to
CO1	Apply the features of object oriented programming languages. (C++ and Java)
CO2	Explore classes, objects, arrays, strings in C++ and Java
CO3	Implement scenarios using collection framework
CO4	Implement the concepts of interfaces, exceptions, multithreading and packages

List of Experiments

Sr. No.	Experiment Title	Co Mapp-ing
1	Write a Java program to display armstrong numbers in the given range(Make use of function). Variations : Implementation of Program with One class Accessibility with static and non-static methods within class and outside class.	CO2
2	**Control Statements** Write a Java program to generate and show all Kaprekar numbers less than 1000. In number theory, a Kaprekar number for a given base is a non-negative integer, the representation of whose square in that base can be split into two parts that add up to the original number again. For instance, 45 is a Kaprekar number, because 452 = 2025 and 20 + 25 = 45.	C02
3	Develop a C++ application that generates an Electricity Bill using a Consumer class.	CO2
4	**Jagged Array** Write a program which stores information about n players in a two dimensional	CO2

	array. The array should contain the number of rows equal to the number of players. Each row will have number of columns equal to number of matches played by that player which may vary from player to player. The program should display player number (index +1), runs scored in all matches and its batting average as output. (It is expected to assign columns to each row dynamically after getting value from the user.	
5	**Array of Objects** Write a program which accepts information about n no of customers from user .Create an array of objects to store account_id ,name,balance. Your program should provide following functionalities 1.To add account 2.To delete any account detail 3. To display account details.	CO1,CO2
6	**Collection Framework** Create a class Employee which stores E-Name, E-Id and E-Salary of an Employee. Use class Vector to maintain an array of Employees with respect to the E-Salary. Provide the following functions 1) Create (): this function will accept the n Employee records in any order and will arrange them in the sorted order. 2) Insert (): to insert the given Employee record at appropriate index in the vector depending upon the E-Salary. 3) delete ByE-name( ): to accept the name of the Employee and delete the record having given name 4) deleteByE-Id ( ): to accept the Id of the Employee and delete the record having given E-Id.	CO2
7	**User Defined Exception** Create a user defined exception subclass NumberException with necessary constructor and overridden toString method. Write a program which accepts a number from the user. It throws an object of the NumberException class if the number contains digit 3 otherwise it displays the appropriate message. On printing, the exception object should display an exception name, appropriate message for exception.	CO1,CO4
8	**Multithreading** Write a java program that implements a multi-thread application that has three threads. First thread generates a random integer every 1 second and if the value is even, the second thread computes the square of the number and prints. If the value is odd, the third thread will print the value of the cube of the number.	CO1,CO4

9	**Packages** Create a package ‘myPackage’ which contains a class myMath. The class contains following static methods. i) power (x, y) – to compute xy ii) fact (x) – to compute x! Write a program to find the following series. cos (x) = 1 – (x2/2!) + (x4/4!) – (x6/6!) + … upto n terms (n given by user). (Do not make use of inbuilt functions. Use the functions of user defined class MyMath by importing mypackage.)	CO4

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