GOVERNMENT ENGINEERING COLLEGE, PATAN

COMPUTER SCIENCE & ENGINEERING

Object Oriented Programming – I (3140705)

Semester 4

List of Practicals

SR NO.	Title	COs
Basic Programs – use of loops, data types, variables, type casting, conditional statements, operators, taking input from user, basic math function, arrays		**CO-1**
1.	a) Write a Program that displays Welcome to Java, Learning Java Now and Programming is fun	
	b) Write a program that solves the following equation and displays the value x and y: 1) 3.4x+50.2y=44.5 2) 2.1x+.55y=5.9 (Assume Cramer's rule to solve equation ax+by=e x=ed-bf/ad-bc cx+dy=f y=af-ec/ad-bc)	
	c) Write a program that reads a number in meters, converts it to feet, and displays the result.	
	d) Body Mass Index (BMI) is a measure of health on weight. It can be calculated by taking your weight in kilograms and dividing by the square of your height in meters. Write a program that prompts the user to enter a weight in pounds and height in inches and displays the BMI. Note:- 1 pound=.45359237 Kg and 1 inch=.0254 meters.	
2.	a) Write a program that prompts the user to enter three integers and display the integers in decreasing order.	
	b) Write a program that prompts the user to enter a letter and check whether a letter is a vowel or constant.	
	c) Assume a vehicle plate number consists of three uppercase letters followed by four digits. Write a program to generate a plate number.	
	d) Write a program that reads an integer and displays all its smallest factors in increasing order. For example if input number is 120, the output should be as follows: 2,2,2,3,5.	
	e) Write a method with following method header: public static int gcd(int num1, int num. Write a program that prompts the user to enter two integers and compute the gcd of two integers.	
	f) Write a test program that prompts the user to enter ten numbers, invoke a method to reverse the numbers, display the numbers.	
	g) Write a program that generate 6*6 two-dimensional matrix, filled with 0's and 1's , display the matrix, check every raw and column have an odd number's of 1's.	
Use of concepts - classes, create objects and methods, how to override and overload methods, String class, Visibility modifiers, inheritance, encapsulation, polymorphism, String builder and String buffer class, this keyword, super keyword, ArrayList, instance of operator, Math class, wrapper classes		**CO-2**

3.	a) Write a program that creates a Random object with seed 1000 and displays the first 100 random integers between 1 and 49 using the NextInt (49) method.	
	b) Write a program for calculator to accept an expression as a string in which the operands and operator are separated by zero or more spaces. For ex: 3+4 and 3 + 4 are acceptable expressions.	
	c) Write a program that creates an Array List and adds a Loan object , a Date object , a string, and a Circle object to the list, and use a loop to display all elements in the list by invoking the object's to String() method.	
	d) Write a program that prompts the user to enter a decimal number and displays the number in a fraction. Hint: Read the decimal number as a string, extract the integer part and fractional part from the string.	
	e) Consider an example of declaring the examination result. Design three classes: Student, Exam, and Result. The Student class has data members such as those representing roll number, name etc. Create the class Exam by inheriting the Student class. The Exam class adds fields representing the marks scored in six subjects. Derive the Result from the Exam class and it has its own fields such as total_Marks. Write an interactive program to model this relationship.	
	f) Write a program to perform following operations on string "GEC PATAN" o Reverse the string o Replace character EC with OV o Check whether strings "PAT" and "UNI" present in original string or not o Compare this program implementation using String and StringBuffer class methods.	
Use of concepts – Exception handling, abstract class, inheritance, thread		**CO3**
4.	a) Write an interactive program to compute the square root of a number. The input values must be tested for validity. If it is negative then user defined method MYSQRT() should raise an exception.	
	b) Write the bin2Dec (string binary String) method to convert a binary string into a decimal number. Implement the bin2Dec method to throw a NumberFormatException if the string is not a binary string.	
	c) An interface Polygon containing the members as given below: • float area, float perimeter • void calcArea( ); abstract method to calculate area of a particular polygon given its dimensions • void calcPeri( ); abstract method to calculate perimeter of a particular • polygon given its dimensions • void display( ); method to display the area and perimeter of the given polygon Create a class Square that implements Polygon and has the following member: • float side • Square(float s); constructor to initialize side of square Create another class Rectangle that implements Polygon and has the following member: • float length, float breadth • Rectangle(int len, int bre); constructor to initialize length and breadth of a rectangle Outside the package, create a class that imports the above package and instantiates an object	

	of the Square class and an object of the Rectangle class. Call the above methods on each of the classes to calculate the area and perimeter given the side and the length/breadth of the Square class and the Rectangle class respectively.	
	d) Write a JAVA program that simulates the action of several bank customers who make deposits to a shared account. Use concept of multithreading and synchronization.	
	e) Create thread t1 and t2. Set priority of main thread to 10, t1 to normal priority +2 and t2 to normal priority -2.	
Use of concepts – JAVAFX		**CO5**
5.	a) Write a program that displays the color of a circle as red when the mouse button is pressed and as blue when the mouse button is released.	
	b) Write a program that displays a tic-tac-toe board. A cell may be X, O, or empty. What to display at each cell is randomly decided. The X and O are images in the files X.gif and O.gif.	
	c) Write a program that moves a circle up, down, left or right using arrow keys.	
	d) Write a program that use button to move the message to the left and right and use the radio button to change the color for the message displayed.	
Use of concepts – I/O and collection framework		**CO4**
6.	a) Write a program to create a file name 123.txt, if it does not exist. Append a new data to it if it already exist. write 150 integers created randomly into the file using Text I/O. Integers are separated by space.	
	b) Write a recursive method that returns the smallest integer in an array. Write a test program that prompts the user to enter an integer and display its product.	
	c) Write a generic method that returns the minimum elements in a two dimensional array.	
	d) Define MYPriorityQueue class that extends Priority Queue to implement the Cloneable interface and implement the clone() method to clone a priority queue.	
	e) Write a program that reads words from a text file and displays all the nonduplicate words in descending order. The text file is passed as a command-line argument.	