Experiment No.	ASSIGNMENT (OBJECTIVE) B. Tech. Object Oriented Programming with JAVA	SELF HELP GROUP(SHG)
Experiment No. (1)	1) Write an application that ask the user to enter two integer, obtain them from user and print their sum, product, difference and quotient and must be use package concept in this application. Q2) Write an application that asks user to enter two integer, obtain them from the user and display the larger number followed by the word "is larger". if the numbers are equal, print the" the number are equal". Path and Classpath Concept use in this Application. Q3) write an application that input three integer from the user and obtain the sum, average,product,largest and smallest of the numbers using interface and abstract class concept. Q4) Write an application that input from the user that the radius of the circle is an integer and the print the circle diameter , circumfrence and area using the floating point value 3.14159 for math.Pi(You can also use the predefined constant math.pi for the value of pi.) Q5)Write an application that inputs one number consisting of five digits from the user, separate the number into its individual digits and print the digit separates from one another for three spaces each. for example if the user type the number 42335 the program should print (4 2 3 3 5). Q6)Write an application that calculate the square and cubes of number from 0to10 and print the resulting value in table format.	SHG(1,2,3,4,5,6)

Experiment No. (2)	Q1)Create an application that calculate your daily driving cost , so that you can estimate how much money could be saved by car pooling which also has other advantages such as reducing carbon emission and traffic congestion . The application should input the following informationand display the user's cost per day of driving to work. • **a)total miles driven per day** • **b)cost per gallon of gasoline** • **c)average fees per day** • **d)tolls per day** Q2.) Create a class called invoice that hardware store might use to represent an invoice for an item sold at the store. An invoice should include four pieces of information as instance variable • **a part number(type string)** • **a part description(type string)** • **a quantity of the item being purchased(type int)** • **a price per item(double)** Your class should have a constructor that initialization the four instance variable . Provide a set and a get method for each instance variable . In addition provide method named getInvoiceAmount that calculate the invoice amount(i.e. multiplies the quantity per item), then return the amount as a double value.If the quantity is not positive it should be set to 0. If the price per item is not positive it should be set to 0.0. Write test application named invoice test that demonstration class invoice capabilities. Q3.)Create a class called employee that include three instance variable a)name(type string) b) last name (type string) and c) monthly salary(double). Provide a constructor that initialize the three instance variable. Provide a set and a get method of instance variable. if the monthly salary is not positive do not set its value. Write a test aplication named employeetest that demonstrate class employee capabilities.create two employee object and display each object yearly salary. Then give each employee a 10% hike and display each employee yearly salary again. Q4.) Create a class called date that include three instance variable a) month(type int) b)day (type int) and c) year (type int) . provide a constructer that initialize a three instance variable and assume the value provided are correct. Provide a set and a get method for each instance variable.Provide a method DisplayDate that display the month year and day separated by forward slashand write a test application named DateTest that demonstrate date capabilities. Q5.)**(Gas mileage**) Drivers are concerned with the mileage theit automobiles get. One driver has kept track of several trips by recording the miles driven and gallons used for each tankful.Develop a java application that will input the miles driven and gallons used(both as in) for each trip.The program should calculate and display the miles per gallon obtained for each trip and print the combined miles per gallon obtained for all trips up to this point. All averaging calculate should produce floating point results. Use class scanner and sentinel-controlled repetition to obtain the data from the user. Q6**.) (Credit limit calculator)** Develop a java application that determines whether any of several department -store customer has exceeded the credit limit on a charge account. For each customer following facts are available: • **account number, balance at the begining of the month** • **total of all items charged by the customer this month.** • **total of all credits applied to the** Q7.)A parking garage charges a $2.00 minimum fee to park for up to three hours. The garage charges an additional $0.50 per hours for each hours or part thereof in excess of three hours. The maximum charge for any given 24-hours period is $10.00.Assume that no car parks for longer than 24 hours at a time. Write an application that calculates and displays the parking charges for each customers who parked in the	**SHG(1,2,3,4,5,6)**

Experiment No. (3)

Q1.)Design a class called figure . It must have three attributes r,aand v of the data type douoble.It must have the following methods:

public void dispArea();

public void dispVolume();

The method dispArea must have a statement to print the volume of a. The method **dispVolume();**

must have a statement to print the value of v.Design a class cone . It must extends class figure class .It must also have the following attributes h,s of type double.It must have following methods:

public void calcArea();

public void calcVolume();

The formulae for the area and volume of the cone are as follows:

Area of a cone(p*r*s)+(p*r*s)

volume of a con=(p*r*s)/3

Write a main method in a class called inheritance demo to demonstrate inheritance.

Q2.) Define an abstract class called Figure having following attribute pi of the data type double. The attribute pi have a value equal to 3.1420.It must have the following abstract methods .

public abstract void calcArea(); public abstract void calcVol();

public abstract void DispArea(); public abstract void Dispvol();

Design three classes cone , sphere and cylinder. Each of these classes must extend the **Figure** class

class name	Attribute
Cone	n,s of type double
Sphere	
cylinder	h of type double

Define the inherited abstract methods in the subclass by using the given formulae and set the value of the inherited attribute a and v for area and volume, rspe. Define any constructor /method that may be necessary. Write a main method in a class called Demo and invoke the methods of each subclass.

Q3.) Design a class named 'x' having two attributes i and j of the type int. Let it have a constructor that takes in two argument of type int and assign them to i and j.Let it also have a method name final sum that compute the sum of i and j that return it.Let a class 'y' **extend** class x,lets it have its own constructer and method name find product that compute and return i*j. lets a class Z extend a class Y.Design a class name multilevel inheritance demo it must have the main method in which the object of class Z is constructed and all the methods(its own and the inherited one) are invokeand the sum difference and the product are display.

Q4.) create a package named **FigPackage**. Define an abstract class called figure having the following attribute r,a,v and pi of the datatype double.the attribute pi must have a value equal to 3.1428.must have the following abstract method-

public abstract void calcArea(); public abstract void calcVolume();

public abstract void dispArea(); public abstract void dispVolume();

design three classes **cone,sphere,cylinder.** each of these class must extends the **Figure** class

class name	Attribute
Cone	n,s of type double
Sphere	
Cylinder	n of the type double

the formulae for the area and volume of the **cone,cylinder and sphere** are as follows:

Class	Formal
cone	area=(pi*r*s)+(pi*r*r)

Experiment No.(4)	Q.1) Write a function to give demostrate the functionality of 3D matrix in 1D matirx. Function prototye: **void set (int value,int indexX,int indexY,int indexZ, int [] 1dArray);** **void get (int value,int indexX,int indexY,int indexZ, int [] 1dArray).** Q.2) We need to write the function to check the password entered is correct or not based on the following conditions. **a) It must have atleast one lower case character and one digit.** **b) It must not have any Upper case characters and any special characters** **c) length should be b/w 5-12.** **d) It should not have any same immediate patterns like** abcanan1 : not acceptable coz of an an pattern abc11se: not acceptable, coz of pattern 11 123sd123 : acceptable, as not immediate pattern adfasdsdf : not acceptable, as no digits Aasdfasd12: not acceptable, as have uppercase character Q.3) A string is entered like **aabcdeaabcjlkjerwlaaabbsadfdsf...** And you have to print those characters which exceed a given no. n entered by user. Q.4) You have to enter a string and check whether it is a perfect string or not. A perfect string is a string which has occurance of every character only once. **Eg. absdhkqwertyuioplmnvczx** Q.5) you have to enter a range from a and b and search how many no. of times a pattern n. occurs between the range a and b. **Eg :i/p:enter range :0 100** **Enter pattern: 13** **o/p: the no. times 13 occurred betwwn 0 to 100:1** **Eg :i/p:enter range :100 1000** **Enter pattern: 13** **o/p: the no. times 13 occurred betwwn 100 to 1000:** **(in this 13,113,131,132,133.139,213,313,.913 all these will be counted)** Q.6)Declare an interface called **Function** that has a method named evaluate that takes an int parameter and returns an int value.Create a class **Half** that implements Function. Make the implementation of the method evaluate() return the value obtained by dividing the int argument by 2.In a client, create a method that takes an arbitrary array of int values as parameter and returns an array that has the same length, but the value of an element in the new array is half that of the value in the corresponding element in the array passed as parameter. Let the implementation of this method create an instance of Half and use this instance to calculate the values in the array to be returned.	**SHG(1,2,3,4,5,6)**

Experiment No.(5)

Q. 1) Image a queue of people standing at the bus stand to buy tickets .whenever a person buys a ticket,he leaves the queue and all the remaining people take one step forward.any new person joins the queue at the back.implement the above queue for integer in the folowing mannerdefine an interface named QueueImpl that will have method to insert into the queue ,delete from the queue and display the integer currently present int the queue.let a class calleld QueueDemo implement the interface .Make your own provisions for exception handaling in case of overflow and underflow condation use an array (with maximum size 10) to hiuse the queue. Write a single main program ti demonstrate the insert ,delete and display operations as well as the Exception handaling in case of overflow and underflow condation.

Q.2) write a complete java program to test whether a given number is a hexadecimal number or not .if it is not ,an exception should be throwns and processed by the program .the exception must be userdefined .the numbere must be assigned to string variable.String function must be used to processing.irrespective of whether the number is a hexadecimal number or not the string Endingthe program must be printed on the screen.

Q.3) Create Product having following attributes: Product ID, Name, Category ID and UnitPrice. Create ElectricalProduct having the following additional attributes: VoltageRange and Wattage. Add a behavior to change the Wattage and price of the electrical product. Display the updated ElectricalProduct details.

Q.4) Define a class called fruit with the following attributes :

1. Name of the fruit. 2. Single fruit or bunch fruit. 3. Price.

Define a suitable constructor and displayFruit() method that displays values of all the attributes. Write a program that creates 2 objects of fruit class and display their attributes.

Q.5) Utopias tax accountants always use programs that compute income taxes even though the tax rate is a solid, never-

changing 15%.Define the program calculate Tax which determines the tax on the gross pay. Define calculate NetPay

that determines the net pay of an employee from the number of hours worked. Assume an hourly rate of $12.

Q.6 Createa class called Student which has the following methods:

i). Average: which would accept marks of 3 examinations & return whether the student has passed or failed Depending on whether he has scored an average above 50 or not.

ii). Input name: which would accept the name of the student & returns the name.

Q.7. Write a program to grade a short multiple choice quiz.the correct answers for the quiz are:

1. C 5. B
2. A 6. C
3. B 7. C
4. D 8. A

Assume that the pass marks are 5 out of 8.the program stores the correct answers in an array.the submitted answers are specifies as program arguments. Let X represents a question that was not answered on the quiz.Use an enum type to represent the result of answering a question.The program calculates and prints a report along the following lines:

QUESTION	SUBMITTED ANS	CORRECT ANS	RESULT
1	C	C	CORRECT
2	B	A	WRONG
3	B	B	CORRECT
4	D	D	CORRECT

Experiment No.(6)	Q.1). Demonstrate the use of 'super' and this keyword(constructor changing) a) To refer to a member of super class. b) To call super class constructor from sub class constructor. Q.2) An old-style movie theater has a simple profit program. Each customer pays $5 per ticket. Every performance costs the theater $20, plus $.50 per attendee.Develop the program calculate TotalProfit that consumes the number of attendees (of a show) and calculates how much income the show earns. Q.3)Create a washing machine class with methods as switchOn, acceptClothes, acceptDetergent, switchOff. acceptClothes accepts the noofClothes as argument & returns the no of Clothes. Q.4. Create an abstract class car contains an instance variable .one concrete method and two abstract method.Maruti and santro are subclass implements the abstrat method of super class and methods are avg() and mode().Create a class Car1 to use all the features of abstract method by creating a reference to it and referring to the subclass object. Q.5) Create a Bank class with methods deposit & withdraw. The deposit method would accept attributes amount & balance & returns the new balance which is the sum of amount & balance. Similarly, the withdraw method would accept the attributes amount & balance & returns the new balance 'balance – amount' if balance > = amount or return 0 otherwise. Q.6) Create a class to model a point in 3D space. Data members x,y,z as coordinate of 3D point are of type int. Constructors: To create 3D point represented the origin arbitrary point. Methods: • **i/p the coordinates of 3D point.** • **o/p the coordinate of 3D point in the form(x,y,z).** • **Compute distance between two points.**	**SHG(1,2,3,4,5,6)**

Experiment No.(7)

Q.1) Develop a program that accepts an initial amount of money (called the principal), a simple annual interest rate, and a number of months will compute the balance at the end of that time. Assume that no additional deposits or withdrawals are made and that a month is 1/12 of a year. Total interest is the product of the principal, the annual interest rate expressed as a decimal, and the number of years.

Q.2)Write a class vehicle .Define suitable attributes and methods. Write subclasses of Vehicle like Car, Bicycle, Scooter.

Assume suitable required attributes. Write constructor for each and define a method maxSpeed() in each class Which prints the maximum speed of the vehicle? (Use of super keyword is expected in the constructor of inherited classes).

Q.3)Create Book having following attributes: Book ID, Title, Author and Price. Create Periodical which has the following additional attributes: Period (weekly, monthly etc…) .Add a behavior to modify the Price and the Period of the periodical. Display the updated periodical details.

Q.4) Write a program to use 'extends' keyword to create student class by reusing Teacher class code.We should write only additional members in student class whih are not available in Teacher class.

Q.5)Suppose it is required to build a project consisting of a number of classes possibly using a large number of programmers.It is necessary to make sure that every class from whih all the other classes in the project will be inherited .Since any new classes in the project must inherit from the base class .Programmers are not free to create any interface.Therefore,it can be guaranted that all the classes in the project will respond to the same debugging commands.

Q.6)Define a class named Course having data members ID, Description, Duration and Fees. The class should have one parametrized constructors and GetData() function member to display the data. Create an array of 5 course objects and then display the data for all of them.

Q.7). Write a program to grade a short multiple choice quiz.the correct answers for the quiz are:

1. **C**
2. **A**
3. **B**
4. **D**

Assume that the pass marks are 2 out of 4.The program stores the correct answers in an array.the submitted answers are specifies as program arguments. Let X represents a question that was not answered on the quiz.Use an enum type to represent the result of answering a question.
The program calculates and prints a report along the following lines:

QUESTION	SUBMITTED ANS	CORRECT ANS	RESULT
1	C	C	CORRECT
2	B	A	WRONG
3	B	B	CORRECT
4	D	D	CORRECT

No. of correct answers: 3
No: of wrong answers. 1
The candidate passed.

Experiment No.(8)	1)write a program to read a line of text from the console.find the position of the first and last occurrence of the string "the" .Copy all the character enclosed between the two positions to another String and print it out. 2) Write a program to read a line of text from the console.Print out only the vowels(a,e,i,o,u) and their position of occurrence. 3) A set of 10 names is given. write a program to delete the first three characters of the names and arrange the resulting names in alphabetical order and print them out. 5) Write a program to read a line of text from the console. change the first character of each word to uppercase letter and print out the resulting string. 6) write a program to read a text file ,"sdj.txt" and replace all his "his" words with another word "her".	**SHG(1,2,3,4,5,6)**
Experiment No.(9)	1)Creation of a thread by extending the thread class the thread is created and started in main method of another class. 2) Creation of a thread by implementing the interface **Runnable** interface the thread is created and stared by the constructor of same class. 3)Program calculate the sin(x) and cos(x) functions by computing the sin series and cos series functions using thread techniques.(sin(x) and cos(x) calculate using **Math class**). 4) Write a program makes two player number game. Players are to feed in an integer number which is not used in the program, but keeps the player engaged in the game. For each player, a random number is generated. the player who gets higher number is the winner. The winner gets points equal to the difference between the two random numbers. 5) Write a java program to convert the sequence of character AB*CD/+ representing the polish notation to the original expression A*B+C/D .use two thread to perform the evaluation. 6) Write a java program to compute the first 25 prime numbers. Also compute the first 50 Fibonacci numbers given by **fn=fn-1 +fn-2** with f1 =f2=1.create two thread to compute each one of them .set the priority of thread that compute Fibonacci number to 8 and the other to 5.After calculating 50 Fibonacci number, make that thread to sleep and take up prime number computation. After computing the 25 prime numbers continue the Fibonacci number computing. 7) A bank account is operated by a father and his son. the account is opened with an initial deposit of Rs. 600. Thereafter, the father deposits a random amount between Rs. 1 and Rs. 200 each time, until the account balance crosses Rs. 2000.the son can start withdraws random amount only if the balance exceeds Rs. 2000.thereafter,the son withdraws random amount between Rs 1 and Rs. 150, until the balance goes below Rs. 500. Once the balances become less than Rs. 500, the father deposits amount till it crosses Rs. 2,000 and the process continues. Write a Father Deposits amount till it crosses Rs. 2000 and the process continues. Write a father and son thread to carry out the above process.	**SHG(1,2,3,4,5,6)**

Project Common Module Design Lab	Q.1) **(Accessing and Update a Database Table)** Write a Java application that views, inserts, and update information stored in a database according to SHG Project. The View button displays a record with a specified ID. Q.2) **(Displaying data)** Write a program that display the number of students in each department (according to SHG project) in a pie chart and a bar chart. The number of Students for each department can be obtained from the Student table (according to SHG project) using the SQL statements. Q.3) **(Displaying Tables)** Write a program that displays the content for a given table (SHG Project). You enter a table and click the show contents button to display the table contents in the text area. Q.4) **(Finding tables and showing their contents in JTables)** Write a program that fills in table name in a combo box (SHG Project). You can select a table from the combo box to display its contents in the JTable. The programming should dynamically add rows and columns to the JTable so that it fits the results. Q.5) **Login and Registration** page Design as Per the SHG Project using Swing and JDBC.	**Common Experiment for SHG**
Project Presentation, Demonstration, and Evaluation		