ASSIGNMENT1

Q1. Write a Simple Java Program to print three characteristics of Object Oriented PRogramming like Java.
Q2. Write a Java program to print a message Welcome (Your name here) to Java Programming where your name is stored in a variable
Q3. Write a program to declare different variavles of different data types used in Java and also show the value that you haave assigned.
Q4. Declare two integer variables then apply +,-,*,/,% operations.Also declare suitable variable to store the result.

ASSINGMENT2

Q1 The basic salary of an employee is 12000.WAP a java to compute Gross and net salary of that employee where HRA = 15%
of basic salary and DA = 110% of basicsalary, pf=12% of salary

Q2 Write in java to define variables to store your name current age previous age and next perform following operations:
a> to set your name and current age
b> that can calculate and set your new age after the years that is equal to last digit of current age
c> That can calculate and set your new age before the years that is equal to first digit fo current age
d> to show your name along with current, previous and next age

Q3 Write separate programs to calculate area of all the shapes given below the geometric shapes are
a> circle b> triangle c>rectangle
define following operations for different figures.
a> set required data b>calculate area of a shape c>display the details of that shape.

ASSINGMENT3

Q1 Convert the temperature reading given in degree fahernheit to degree celsius using
the given formula:c=(5/9)*(F-32)
Test these values in degree fahernheit using command line argument
68,150,212,0,-22,-200
Q2. Calculate the volume and surface are3a of a shpere using the following formula:
v = 4/3πrrr A = 4πrr
Test the program using command line argument for the given
radius:1,6,12,0.2
Q3. WAP to java to find the smaller and greater number among two numbers read from command line
argument using ternary operator.

Q4. Write a program to show the use of ++,-- and different assignment operators.

Q5. WAP to observe the difference between - and ~ operator

ASSINGMENT6

WAP to create a class Array having member variable as an integer array and its size.
Allocate memeory for the Array as per the size specified and intitialize it to zero using constructor.
Design methods to perform the following operations on the array:
1> input requred elements into the array.
2> Calculate sum and average of elemnt.
3> Swap the max and min elements
4> find the occurrenc of all unique elements
5> MAke three digit number by taking values from three consecutive indexes starting from zero to end. If the value at any index is not a single digit then make it a single digit by adding the digits repeatedly. if the index is not sufficient to make three digit then add zeros to the right to make it thre digit find the greatest nmber out of these new numbers.
EX Original values 3,7,4,25,190,2,87 New values are 374,712,600 and greatest value is 712

ASSINGMENT7

Q1. Input a number and ifnd the sum of all the digit
Q2. in the above program count and print those digits from the result number which are also present in the original number;
Q3. input a number and check whether it is palindrome or not.
Q4. input a number and check whether it is an Armstrong number or not
Q5. input 10 numbers and find out the largest and the smallest number without using array.
Q6.input a number and find all the prime factors of that number.
Q7. print a Fibonacci series up to nth term

ASSINGMENT8

Series and Patterns using oops

1) WAP in java to print and find the sum of following series:

a) 1+1/2+1/3+1/4+1/5+…+1/n find the sum of this series

b) 1+1/x+1/x^2+1/x^3+…...+1/x^n find the sum of this series

c) 1+1/2! +1/3! +…...+ 1/n! find the sum.

d) 1+2^3+3^3+……n^3.

2) Find all 4-digit numbers which satisfies the condition that, square of (first two digit last two digit) =original number. E.g., if a number is 3025 then (30+25) ^2=3025.

3) Input any number and reduce it to single digit by adding all its digits repeatedly.

4) Multiply all digits of a number till a single digit is found. Zeros should be ignored from the numbers, E.g., if the number is 406, then result should be 8. (4*6),(2*4=8)

6) Generate the following pattern

```
10001
01010
00100
01010
10001
54321
5432
543
54
5
```

ASSINGMENT9

2) WAP in java to design a class fraction having data members num and denom.

Define default constructor,one argument constructor,two argument constructor
and a copy constructor to set the values to numerator and denominator of differen object.
define methods such as
show(),add(),substract(),multiply(),div(),compare(),mixed(),and reduce()
create different objects using differen constructors given above.Perform the above operation using appropriate methods.Show the result in reduced form of the result fraction after each operationl.After reducing if the fraction is an improper function the represent it in the form of mixed fraction

create a class complex having member variable real and imag.Also create constructor and methods as follows:
complex()
complex(int,int)
complex(complex)
void showComplex()
complex addComplex(complex)
complex substractComplex(Complex)
Complex multiplyComplex(Complex)
Write a java program to create objects of above class and perform operations as the methods specified above

ASSINGMENT10

WAP to create a class Array having member variable as an integer array and its size.
Allocate memeory for the Array as per the size specified and intitialize it to zero using constructor.
Design methods to perform the following operations on the array:
1> input requred elements into the array.
2> Calculate sum and average of elemnt.
3> Swap the max and min elements
4> find the occurrenc of all unique elements
5> MAke three digit number by taking values from three consecutive indexes starting from zero to end. If the value at any index is not a single digit then make it a single digit by adding the digits repeatedly. if the index is not sufficient to make three digit then add zeros to the right to make it thre digit find the greatest nmber out of these new numbers.
EX Original values 3,7,4,25,190,2,87 New values are 374,712,600 and greatest value is 712

ASSINGMENT11

3) WAP in java to design a class SortArray with suitable data member and member functions to do the following operations:

a> To allocate memeory for the array of n size which is to be sorted.
b> To input n numbers into the array.
c> To show the values sorted in the array.
To arrange them in accending.descending order using:
d> Bubble SortArray e> Selection sorted
f> insertion sort g> Merge SortArray
h> Quick SortArray

ASSINGMENT12

Q1 WAP in java to create two classes such as 2D Array and 1D Array
Members of 2D Array are:
a> One 2D Array
b> Constructor to allocate Memory size(2 X n) for the array.
c> Input Data into the array
d> Display the array Elemnet in Row Wise
e> Split the array into two different arrays and store then in the array available in two different objects of class OneArray.
f> Add the arrays(m X N martices) of two objects of 2D Array class
g> Multiply the arrays(m X n) of two objects of 2D Array class
Members of 1D Array class are:
a>One 1D Array
b>Constructor to allocate memory of size (n) has the column size of 2D Array class
c> Show the Array

Q2 Modify the above program to create same (m) no of array of objects of 1D Array as the no of rows available in the array (m X n) of 2D Array.Then add another method in 2D Array class that can distribute all rows of the 2D array of 2D Array class into each objects of 1D Array class.

Assignment -13
(Jagged Array)

Q1. There are five brothers and sisters are trying to store their marks in one reference (array) for better analysis. But the number of subjects is different for each child as they are reading in different classes. Child1 has 3 subjects, Child2 has 5 subjects, Child3 has 2 subjects, Child4 has 6 subjects and Child5 has 4 subjects. Help them to achieve this.

Design a class JaggedArray with following members:

a) One Array to hold the marks of five brothers & sisters.
b) Constructor to allocate memory for the Array ***exactly*** as the no of subjects specified for five children.
c) Input marks in different subjects for different children.
d) Show the marks row-wise with child name at the beginning.
e) Show the total marks scored by each child.
f) Count the marks which are more than 80 separately for each child.
g) Alert them by showing the marks which are less than 30 for better preparation.

Assignment-14
(Array of Objects & Static Method)

1. Write a java program to create a class ***CricketPlayer*** (***name, no_of_innings, times_ of_notout, total_runs, bat_avg***). Create an *array of objects* for n players. Calculate the batting average for each player using a *static method* ***avg()***. Define a *static method* "***sortPlayer( )***" which sorts the array on the basis of batting average. Display the player details in sorted order.
2. Create a class called ***Account*** having data members ***acct_no***, ***acct_type***, ***customer_name*** and ***acct_balance***. Write a java program to input data for five customers and print the details of customer having maximum balance in the account.

Assignment -15
(String Operations)

1. Write a java program to define a class **User**S**tring** and to perform the following operations using different methods.
   a) Count all the characters
   b) Count no of words
   c) Compare two strings
   d) Convert to uppercase
   e) Convert to lowercase

f) Concatenate two strings
g) Check a string is palindrome or not
h) Find the position of a given character
i) Make a substring from a desired start and end position.
j) Search the presence of a substring.
k) Replace a substring with a new string.
l) Swap two substrings between two strings.

Assignment – 16
(Single & Hierarchical Inheritance)

1. Create a class Vehicle as follows :
   Data members (All are private) –[Brand, Country_of_Origin, Base_price]
   Methods - input (to input details of vehicle) and display (to show vehicle details).
   Create a sub class Car as follows:
   Data members – [Model, speed, Market_price]
   [NB: Market price of a car can be calculated from the Base price and speed. If speed is above 80km/hr, market price will be 15% more than the base price otherwise market price will be 5% less than the base price.]
   Methods – read (to input car details) and show (to show car details).
   In addition to above methods add more appropriate methods to set the required data members.
   Now create objects. Input required data and show the details (Brand, Country_of_Origin, Base_price, Model, speed, Market_price) of any car.
2. Create two classes such as ***Teacher*** (basic, da, hra, epf, sub_taught) and ***Student*** (fees_per_sem, course, duration) which are inherited from class ***Person***(name, Id, year_of_join). Design appropriate methods to input the data as given above whenever required.
   Prepare an annual report for a Teacher showing the details such as Name, Id, Subject Taught, Joining year, Basic salary per month, Total net salary received per year, Total Epf deposited per year. If [Basic=15500/-, da=110%, hra=15%, and epf=12%]
   Inform the student by showing details such as Name, Id, Course Offered, Joining year and total fees to be paid if the course duration is 4 years and fees per semester is 18000/-.

Assignment – 17
(Multi-Level Inheritance)

1. Create a class *Number* :
   Data member: An array of type integer.
   Constructor: Constructor with one parameter n, that is the size of the array. Allocate n memory for the array and input n numbers into the array.
   Method-1: To display all the values in the array.
   Derive a class *OddNum* from the class *Number*:
   Data member: An array of type integer.
   Constructor: To count the odd numbers present in the array of its base class *Number* and accordingly allocate memory for its own array.
   Method-1: To copy all odd numbers from its base class array to its own array.
   Method-2: To display all odd numbers.
   Derive a class *PrimeNum* from the class *OddNum*:
   Data member: An array of type integer.
   Constructor: To count the prime numbers present in the array of its base class *OddNum* and accordingly allocate memory for its own array.
   Method-1: To copy all prime numbers from its base class array to its own array.
   Method-2: To display all prime numbers.
2. Define a class ***Employee*** having private members – id, name, department, salary. Define default and parameterized constructors. Create a subclass called "***Manager***" with private member bonus. Define methods ***accept()*** and ***display()*** in both the classes. Create ***n*** objects of the ***Manager*** class and display the details of the manager having the maximum total salary (salary+bonus).

Assignment-18

(Abstract Class)

Q1. Create a class Shape having data members length, breadth, height and abstract methods such as volume and surfaceArea. Inherit this class into cube, cylinder and cuboid classes. Redefine the required methods to calculate and display the volume and surface area of each shape.

Q2. Design an abstract class fruit with data members colour, taste and an abstract method display. Inherit this class to other classes such as Apple, Banana, Orange and Strawberry. Redefine the display method to show the color and taste of each fruit along with its name.

Assignment -19

(Interface)

1. Define an interface "IntOperations" with methods to check whether a number is positive/negative, even/odd, prime, palindrome and operations like factorial and

sum of digits. Define a class MyNumber having one private data member of type int. Write a default constructor to initialize it to 0 and another constructor to initialize it to a value (Use this). Implement the above interface. Create an object in main method. Input a number and write a menu driven program to check different properties of the number using above methods.

2. Define an interface "StackOperations" which declares methods for a static stack. Define a class "MyStack" which contains an array and top as data members and implements the above interface. Initialize the stack using a constructor. Write a menu driven program to perform all operations(Push, POP, Peak) on a MyStack object.

Assignment -20
(Package)

1. Create a package named **mathop**. Define class MathsOperations with static methods to find the maximum and minimum of n numbers. Create another package **statop**. Define class StatsOperations with methods to find the average and median of n numbers. Import these packages to use the above methods to perform above operations on n numbers.
2. Create a package called **nodepack** which contains the class "Node". Create another package called **listpack** which contains the class "LinkedList" representing methods to create a Single Linked list, Add a node to the list and traverse the list. Write a menu driven program in main to create a Single Linked list, Add nodes and display the List. The elements are passed as user input.

Assignment – 21
(Built-In-Exception)

1. Input two numbers as numerator and denominator for division. Write a program to show an ArithmeticException if the division is not possible when denominator is 0.
2. Define an array of size n and set some values to it. Show an ArrayIndexOutOfBoundException when trying to access the index that is more than size of the array.
3. Write a program to show the use of NullPointerException.

Assignment – 22
(UserDefined-Exception)

1. Define Exceptions VowelException, BlankException, ExitException to restrict the input of vowel, space and 'X'. Write another class TestException which reads a character from command line. If it is a vowel, throw VowelException, if it is a blank space throw BlankException and for a character 'X' throw an

ExitException and terminate the program. For any other character, display "Valid character".

2. Write a program which accepts two integers and an arithmetic operator from the command line and performs the operation. Check the following user defined exceptions:
   i. If the number of arguments are less than 3 then throw "FewArgumentsException".
   ii. If the operator is not an Arithmetic operator, throw "InvalidOperatorException".
   iii. If result is –ve, then throw "NegativeResult" exception.
3. Create a class **Student** with attributes roll no, name, age and course. Initialize values through parameterized constructor. If age of student is not between 15 and 21 then generate user-defined exception "InvalidAgeException". If name contains numbers or special characters raise exception "InvalidNameException**".** Define the two exception classes.
4. Define class MyDate with members day, month and year. Define default and parameterized constructors. Accept values from the command line and create a date object. Throw user defined exceptions – "InvalidDayException" or "InvalidMonthException" if the day or month are invalid. If the date is valid, display message "Valid Date".