**UNIT -1**

A palindromic primeis a prime number and also palindromic. For example, 131 is a prime and also a palindromic prime. So are 313 and 757. Develop a program that displays the first 100 palindromic prime numbers. Display 10 numbers per line and align the numbers properly, as follows:

2 3 5 7 11 101 131 151 181 191 313 353 373 383 727 757 787 797 919 929

Design a class that contains the followingtwo methods:

/\*\* Converts from Celsius to Fahrenheit \*/

**public static double** celsiusToFahrenheit(**double** celsius)

/\*\* Converts from Fahrenheit to Celsius \*/

**public static double** fahrenheitToCelsius(**double** fahrenheit)

The formula for the conversion is:

fahrenheit = (9.0 / 5) \* celsius + 32

Write a test program that invokes these methods to display the following tables:

**Celsius Fahrenheit Fahrenheit Celsius**

40.0 104.0 120.0 48.89

39.0 102.2 110.0 43.33

...

32.0 89.6 40.0 4.44

31.0 87.8 30.0 -1.11

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. The interpretation of BMI for people 16 years or older is as follows:

BMI Interpretation

below 16 seriously underweight

16–18 underweight

18–24 normal weight

24–29 overweight

29–35 seriously overweight

above 35 gravely overweight

Develop a program that prompts the user to enter a weight in pounds and height in inches and display the BMI. Note that one pound is **0.45359237** kilograms and one inch is **0.0254** meters.

Develop a program that reads an integer between **0** and **1000** and adds all the digits in the integer. For example, if an integer is **932**, the sum of all its digits is **14**.

Hint: Use the **%** operator to extract digits, and use the **/** operator to remove the extracted digit. For instance, **932 % 10 = 2** and **932 / 10 = 93**.

Develop a program that reads an integer and displays all its smallest factors in increasing order. For example, if the input integer is **120**, the output should be as follows: **2**, **2**, **2**, **3**, **5**.

Develop a program to monitor the growth of an investment that accumulates interest at a fixed annual rate. Here is a sample output:

Initial Balance= 10000

Rate of Interest = 5

The investment doubled after 15 years

Given a non-negative int n, return the count of the occurrences of 7 as a digit, so for example 717 yields 2. (no loops). Note that mod (%) by 10 yields the rightmost digit (126 % 10 is 6), while divide (/) by 10 removes the rightmost digit (126 / 10 is 12).

Write a program to define employee class and show how the data can be hided and accessed.

Write a program to add two 3 X3 matrices and to return the resultant matrix to the

calling method.(30)

Write a method to compute the sum of this geometric progression:(30)

1+x+x2+x3+………….+xn

Write a Distance class to read, add, subtract and display distances. Distance must be

defined using kilometers and meters.(50)

Write a program to create an array of employee object. Write method to create employee

record and throw exception for an invalid email("@") and mobile number.(50)

Write a program to use a player class and provide the following.(70)

(i)Display players based on the tournament name.

(ii)Display the list of tournaments played by a player

(iii)Sort players based on their scores earned.

(iv)Assign and remove players to the tournament

Create a Bill class for a supermarket. The bill objects contain bill number, item name

with quantity and price , clerk name and total amount. Create a class that contain price for

each item. The price of an item is to picked from the class. The items in the bill are varying

i.e. 1 to 30.(60)