## 1.Programs using Data types, Operators and Control Structures

***CO1**: Impart the skills needed for Object – oriented programming and Console applications development*.

1. Write a C++ program to compute the area and perimeter of a rectangle.(Formula: Area=length x breadth, Perimeter=2(length + breadth)
2. Calculate the volume and surface area of a sphere. $Volume = \frac{4\pi r^3}{3}$ $and\ Surface\ Area = 4\pi r^2$
3. The distance between the Sun and the Earth is $1.496 \times 10^8$ km and distance between the Earth and the Moon is $3.84 \times 10^8$ m. During solar eclipse the Moon comes in between the Earth and the Sun. Write a program to calculate the distance between the Moon and the Sun at that particular time?
4. The area of a rectangular field is 48 $m^2$ and one of its sides is 6m. Write a C++ program to calculate the time taken by a person to cross the field diagonally at the rate of 20 m/minute?
5. Earth takes a period of revolution of 31558150 seconds. Write a program to find the number of days, hours, minutes and seconds present for the given seconds.
6. Write a program to multiply the given number by 8 without using * operator. (**Hint:** use Bitwise operator)
7. Write a program to check whether the given number is even or odd using bitwise operator (&)
8. Write a program to read the age of a candidate and determine whether he/she is eligible to cast their vote. If user is not eligible, display how many years are left to be eligible.
9. Write a program to check given year is leap year or not.
   (In the Gregorian calendar **three criteria must be taken into account** to identify leap years: Every year that is exactly divisible by four is a leap year, except for years that are exactly divisible by 100, but these centurial years are leap years if they are exactly divisible by 400. For example, the years 1700, 1800, and 1900 are not leap years, but the years 1600 and 2000 are.)
10. Write a program to read temperature in centigrade and display a suitable message according to temperature state below :
    i. Temp < 0 then Freezing weather
    ii. Temp 0-10 then Very Cold weather
    iii. Temp 10-20 then Cold weather
    iv. Temp 20-30 then Normal in Temp
    v. Temp 30-40 then Its Hot
    vi. Temp >=40 then Its Very Hot
11. Write a series of C++ statements that will read two strings from the user, and then print them in dictionary order.
12. Write a program to print the multiples of 7 between 1 to 50 in reverse order. Ex- 49, 42, ...., 7
13. Write a program to take integer inputs from the user until he/she presses '#' and print the product of all numbers.

14. Write a program to check whether given number is prime or not.
15. Using a series of nested for loops, find all Pythagorean triples consisting of positive integers less than or equal to 20.