Programming 1: Lab 2 : Operators, Expressions and Conditions

Write the python code for the following questions.

1. Write a program to display "Hi" if the number entered by user is divisible by 5, otherwise print "Bye".
2. If the lengths of the two parallel sides of a trapezoid are X meters and Y meters, respectively, and the height is H meters, what is the area of the trapezoid? Write Python code to output the area by taking X, Y and H as input from the user.
3. Write a program that interprets the Body Mass Index (BMI) based on a user's weight and height.

   It should tell them the interpretation of their BMI based on the BMI value.
   • Under 18.5 they are underweight
   • Over 18.5 but below 25 they have a normal weight
   • Over 25 but below 30 they are slightly overweight
   • Over 30 but below 35 they are obese
   • Above 35 they are clinically obese.

   The BMI is calculated by dividing a person's weight (in kg) by the square of their height (in m). Take height and weight from the user.
4. Write a Python program to check whether an alphabet is a vowel or consonant.
5. Suppose a surface initially contained 2.19×10^{14} bacterial cells. After some time, the surface contained 4.68×10^{14} bacterial cells. Calculate the percentage of bacterial growth. Display the answer rounded to the nearest whole number.
6. Write a program that asks the user to enter a whole number of months as input and then converts that amount of time to years and months. The program should use both integer division and the modulus operator.
7. The color of the beacon light atop Boston's old John Hancock building forecasts the weather according to the following rhyme:
   Steady blue, clear view.
   Flashing blue, clouds due.
   Steady red, rain ahead.
   Flashing red, snow instead.
   Write a program that requests a color (Blue or Red) and a mode (Steady or Flashing) as input and then displays the weather forecast.
8. Write a program that requests the costs and revenue for a company and displays the message "Break even" if the costs and revenue are equal; otherwise, it displays the profit or loss.
9. A store sells widgets at 25 cents each for small orders or at 20 cents each for orders of 100 or more. Write a program that requests the number of widgets ordered and displays the total cost.
10. A supermarket sells apples for $2.50 per pound. Write a cashier's program that requests the number of pounds and the amount of cash tendered as input and displays the change from the transaction. If the cash is not enough, the message "You owe $x.xx more." should be displayed, where $x.xx is the difference between the total cost and the cash.
11. Find the largest of 3 numbers using nested if else condition.

12. Calculate the gross salary of an employee by taking as input the basic Salary. HRA = 20% of basic salary, TA is 5% of basic salary, and DA is 10% of basic salary. Gross Salary = Basic Salary + HRA + TA + DA.
13. Further, in the above question, find the income tax slab in which the employee lies.

Gross Salary	**Income Tax**
< Rs. 3 LPA	0%
Rs. 3,00,000 – Rs. 10,00,000	10% of the gross salary
Rs. 10,00,000 – Rs. 25,00,000	20% of the gross salary
Above Rs. 25,00,000	30% of the gross salary

14. The flowchart given below calculates a person's state income tax. Write a program corresponding to the flowchart.