# **Module 5: Programming**

**Overview**

At the end of this unit, students will be able to:

5.1 Understand and implement basic concepts of GPIO programming

### Activity 5.1 FORMATIVE ASSESSMENT

(Individual work, written and discussion activity, self-assessed).

5.1.1 Define the term programming. (2)

5.1.2 What is meant by the term physical computing? (2)

5.1.3 List two types of signals in electronics. (2)

5.1.4 What is the difference between the two types of signals identified in question 5.3? (6)

5.1.5 What does the abbreviation GPIO stands for? (1)

5.1.6 How many pins are of the Raspberry Pi 4? (1)

5.1.7 Use Scratch to create a program which will light an LED. List the components needed and show the Scratch code. (10)

5.1.8 What do you understand by the term Integrated Development Environment. (2)

5.1.9 Write a raspberry command which can be executed from the terminal to display the GPIO pins. (1)

5.1.10 Write a Python program to convert temperatures to and from celsius, fahrenheit.    
 [ Formula : c/5 = f-32/9 [ where c = temperature in celsius and f = temperature in fahrenheit ]  
 Sample Output :  
 60°C is 140 in Fahrenheit  
 45°F is 7 in Celsius (10)

5.1.11 List THREE different constructs used in programming. (3)

**Total =[50 marks]**

**Overview**

At the end of this unit, students will be able to:

5.2 demonstrate ability to use GPIO programming, implement practical projects and physical computing

### Activity 5.2 FORMATIVE ASSESSMENT

(Individual work, written and discussion activity, self-assessed).

5.2.1 Write a Python code to control an LED with push button. (20)

**Total =[20 marks]**

### Activity 5.3 SUMMATIVE ASSESSMENT

(Individual work, written and discussion activity, self-assessed).

5.3.1 List any FOUR factors that can be used to evaluate programming code. (4)

5.3.2 There is a continuous representation of signals in analog signals. True or False. (1)

5.3.3 What is the use of GPIO pins on the Raspberry Pi? (2)

5.3.4 What will be the output of the following statement on Python Shell and give a reason. (2) eval("6+6")

5.3.5 Differentiate the terms input and output as applied to the Raspberry Pi. (4)

5.3.6 What do you understand by deploying an application? (2)

5.3.7 Write a Python Code on the Raspberry Pi to read the temperature using DS18B20 Temperature Sensor. (20)

**Total= [35 marks]**