BINDURA UNIVERSITY OF SCIENCE EDUCATION

ENGINEERING AND PHYSICS DEPARTMENT

BACHELOR OF SCIENCE HONOURS DEGREE IN ENVIRONMENTAL PHYSICS AND ENERGY SOURCES

INTRODUCTION TO COMPUTER PROGRAMMING - HPH114

Duration: Three (3) Hours AUG 2024

Instructions:

Answer ALL parts of Section A using an answer booklet and any THREE questions from Section B using a Computer.

Section A carries 40 marks and each question of Section B carries 20 marks.

SECTION A (Theory use an answer booklet)

Question 1

a) Define the following terms:

i. Identifier [1]

ii. Variable [1]

iii. Debugging [1]

iv. Program [1]

v. Array [1]

vi. Syntax error [1]

vii. Flowchart [1]

b) Describe what happens if you run the program below

```
5 > 2:
  print("Five is greater than two!").
```

[2]

c) After opening Python, where do you enter statements? [1]

d) List and explain any five data types in Python. [10]

e) What is wrong with the following code and how do you correct it? [4]

```
radius = -20
if radius >= 0:
    area = radius * radius * math.pi
print("The area is", area)
```

f) **Describe the following basic instructions that appear in almost every language:**

i. **Input** [2]

ii. **Output** [2]

iii. **Math** [2]

iv. **Conditional execution** [2]

g) Draw a flow chart diagram for the following program. [8]

```
# start
num = input("Enter a number: ")
num = float(num)
num_plus_2 = num + 2
print(num_plus_2)
# end
```

SECTION B (Practical, use a Computer)

Question 2

Write a program that displays the following table (note that 1 kilogram is 2.2 pounds):

Kilograms	Pounds
1	2.2
3	6.6
...	
197	433.4
199	437.8

[20]

Question 3

Write a Python program to take a character from the user and search for that character in the file. If the character is present, print that character's total count in the file or else display the message "No such character". [20]

Question 4

Write a program that draws a diagram for the function $f(x) = x^2$f(x). **[20]**

Question 5

Create a module "Area.py" with functions area_circle(), area_triangle() and area_rect(). Create a new file. Use area_circle(), area_triangle() and area_rect() from the Area module to calculate the areas. **[20]**

Question 6

Suppose that the tuition for a university is $10,000 this year and increases 7% every year. Write a programme to show how many years will the tuition have doubled.

[20]

**********END OF PAPER**********