UNIVERSITY EXAMINATIONS

EXAMINATION FOR JANUARY/APRIL 2025/2026 FOR DIPLOMA IN COMPUTER SCIENCE / DIPLOMA IN BUSINESS INFORMATION TECHNOLOGY

RCS 013: INTRODUCTION TO COMPUTER PROGRAMMING

DATE: APRIL 2025 TIME: 2 HOURS

GENERAL INSTRUCTIONS:

Students are NOT permitted to write on the examination paper during examination time.

This is a closed book examination. Text book/Reference books/notes/AI are not permitted.

SPECIAL INSTRUCTIONS:

This examination paper consists Questions in Section A followed by section B.

Answer **Question 1 and any Other Two** questions.

QUESTIONS in ALL Sections should be answered in answer booklet(s).

1. **PLEASE start the answer to EACH question on a NEW PAGE.**
2. **Keep your phone(s) switched off at the front of the examination room.**
3. **Keep ALL bags and caps at the front of the examination room and DO NOT refer to ANY unauthorized material before or during the course of the examination.**
4. **ALWAYS show your working.**
5. **Marks indicated in parenthesis i.e. ( ) will be awarded for clear and logical answers.**
6. **Write your REGISTRATION No. clearly on the answer booklet(s).**
7. **For the Questions, write the number of the question on the answer booklet(s) in the order you answered them.**
8. **DO NOT use your PHONE as a CALCULATOR.**
9. **YOU are ONLY ALLOWED to leave the exam room 30minutes to the end of the Exam.**
10. **DO NOT write on the QUESTION PAPER. Use the back of your BOOKLET for any calculations or rough work.**

SECTION A (COMPULSORY-ANSWER ALL QUESTIONS)

Question One (30marks)

a. Define the following programming terms: **(5 marks)**

   i. Programming

   ii. Syntax

   iii. Debugging

   iv. Variable

   v. Data type

b. List **five** real-world applications of Python. **(5marks)**

c. Identify **four** common data types used in Python and provide one example for each. **(4marks)**

d. Consider the following Python code snippet:

```
1  x = "10"
2  y = 5
3  print(x + y)
```

   i. What will happen when this code is executed? **(2marks)**

   ii. How can you correct the error? **(2marks)**

e. Explain the difference between a **compiler** and an **interpreter**. Which one does Python use? **(3marks)**

f. Explain any **four** features that make Python a beginner-friendly programming language. **(4marks)**

g. Write a Python program that asks a user to input their name and age, then prints:

   "Hello [Name], you are [Age] years old!" **(5marks)**

SECTION B (ANSWER ANY TWO QUESTIONS)

Question Two (15 marks)

a) Explain **three** key rules for naming variables in Python. **(3marks)**

b) Differentiate between **mutable** and **immutable** data types in Python. **(4marks)**

c) Consider the following Python code snippet:

```
num = 10
if num > 0:
    print("Positive")
elif num < 0:
    print("Negative")
else:
    print("Zero")
```

i. What will be the output when num = -5? **(2marks)**

ii. Explain how the **if-elif-else** structure works. **(3marks)**

iii. Modify the code to check if num is an even or odd number **(3marks)**

Question Three (15 marks)

a) Convert the following while loop into a for loop: **(2marks)**

```
i = 1
while i <= 5:
    print(i)
    i += 1
```

b) Explain **two** differences between a for loop and a while loop **(4marks)**

c) Write a Python program that prints numbers from **1 to 10**, but skips the number **5** using a loop. **(5marks)**

d) Define the following terms as used in loops: **(4marks)**

i) Iteration

ii) Infinite loop

iii) break statement

iv) continue statement

Question Four (15 Marks)

a) Explain two differences between a **list** and a **tuple** in Python. **(4marks)**

b) Given the list below, write Python code to: **(4marks)**

```
fruits = ["apple", "banana", "cherry", "mango"]
```

i) Add `"grape"` to the list

ii) Remove `"banana"` from the list.

c) Consider the following Python function:

```
1  def greet(name):
2      return "Hello, " + name + "!"
```

i) What is the purpose of this function? **(2marks)**

ii) Modify the function to also ask the user for their name before printing the greeting. **(3marks)**

iii) What is the difference between a function **definition** and a function **call**? **(2marks)**

Question Five (15 marks)

a) What is an exception in Python? **(2marks)**

b) Consider the following Python code snippet:

```
try:
    num = int(input("Enter a number: "))
    print(10 / num)
except ZeroDivisionError:
    print("Error: Cannot divide by zero!")
except ValueError:
    print("Error: Invalid input!")
```

i) What will happen if the user enters 0? **(2marks)**

ii) What will happen if the user enters "hello"? **(2marks)**

c) Explain **three** advantages of handling exceptions in Python. **(3marks)**

d) Write a Python program that opens a file called "data.txt" in **write mode**, writes the text *"Hello, Python!"* to it, then closes the file.

(4marks)

e) What happens if you try to open a file that **does not exist** in "r" (read) mode?

(2marks)