INFORMATION AND COMMUNICATIONS UNIVERSITY

FUNDAMENTALS OF PROGRAMMING

**2025 NOVEMBER/DECEMBER EXAMINATION**
TIME ALLOWED: 3 HOURS
TOTAL MARKS: 100

INSTRUCTIONS
This exam is divided into THREE sections: A, B, and C.
Answer all questions in Section A.
Answer all questions in Section B.
Answer only ONE question from Section C.
Write as clearly as possible—illegible handwriting cannot be marked.
Number your answers clearly before writing them.

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## SECTION A – SHORT ANSWER QUESTIONS (25 MARKS TOTAL)

1. Define a function in Python and list three advantages of using functions in programming.

2. Explain the difference between parameters and arguments with an example.

3. Distinguish between local and global variables. Give a short program that demonstrates both.

4. Explain what a try...except block does and state its importance in programming.

5. Describe the difference between text files and binary files in Python. Give one example of each.

## SECTION B – PRACTICAL PROGRAMMING QUESTIONS (50 MARKS TOTAL)

1. Write a Python function named is_even() that returns True if a number is even and False otherwise. Then, write a short program that asks the user for a number and displays whether it is even or odd. (10 marks)

2. Write a function named sum_and_average() that takes a list of numbers as input and returns both the sum and average as a tuple. Demonstrate your function using a list of five integers entered by the user. (10 marks)

3. Write a program that safely divides two numbers entered by the user. Your program should handle division-by-zero errors using a try...except block and display a suitable message to the user. (10 marks)

4. Complete the program below to write 5 student names into a file called students.txt, then read and display all names from the same file: (10 marks)

```
file = open('students.txt', '__')
for i in range(5):
  name = input('Enter name: ')
  file.write(name + '\n')
file.close()

file = open('students.txt', '__')
print(file.read())
file.close()
```

5. Write a Python program that writes the numbers 1 to 10 into a file called numbers.txt, then reads and prints only the even numbers from that file. (10 marks)

## SECTION C (25 MARKS TOTAL)

1. Define Object-Oriented Programming (OOP) and explain its four main principles: Encapsulation, Inheritance, Polymorphism, and Abstraction. Use suitable examples in Python to illustrate each principle. (25 marks)

2. Create a Python class named Car with attributes brand and model, and a method display_info() that prints both attributes. Then, create a subclass Electric Car that inherits from Car and adds a new attribute battery_capacity. Demonstrate how inheritance works by creating an object of each class and displaying their information. (25 marks)

3. Explain how encapsulation improves data security in programming. Write a short Python program that demonstrates how private attributes can be used to protect data within a class. (25 marks)