Test

Section A: Multiple Choice Questions (MCQs)

1. **What is method overloading in Python?**

   a) Defining multiple methods with the same name but different implementations

   b) Defining multiple functions with the same name but different parameters

   c) Using decorators to modify method behavior

   d) Python does not support method overloading

2. **Which of the following statements is true about positional-only arguments in Python?**

   a) They must be passed by keyword

   b) They are indicated using `/` in function definitions

   c) They must always have default values

   d) They are deprecated in Python 3.8

3. **How do you define a function with keyword-only arguments?**

   a) By using `*args` before them

   b) By using `/` after them

   c) By using `*` before them

   d) By using `**kwargs`

4. **What happens if you mix positional-only and keyword-only arguments incorrectly?**

   a) Python automatically converts them

   b) The function executes normally

   c) A `SyntaxError` is raised

d) Python assumes all arguments are keyword arguments

5. **What is recursion in Python?**
   a) A function calling itself
   b) A function calling another function
   c) A function returning multiple values
   d) Using loops to iterate over a list
6. **What is the base condition in recursion?**
   a) The condition where the function calls itself infinitely
   b) The condition where the function stops calling itself
   c) The first argument of the function
   d) The return statement of the function
7. **Which of the following statements about recursion is true?**
   a) Recursion is always faster than loops
   b) Recursion must have a base condition to avoid infinite calls
   c) Recursion cannot return a value
   d) Python does not support recursion

Section B: Practical Questions

1. **Implement a Python function using method overloading (using default arguments) to calculate the area of a square and a rectangle.**
   - If only one argument is given, calculate the area of a square.
   - If two arguments are given, calculate the area of a rectangle.
2. **Write a Python function that accepts only positional-only arguments for a person's first name and last name, and prints them.**
3. **Create a function that accepts only keyword-only arguments for a person's age and city, then prints them.**
4. **Write a Python function that combines positional-only and keyword-only arguments to print a person's first name (positional-only) and their city**

(keyword-only).

5. **Implement a recursive function to calculate the factorial of a number.**
6. **Write a recursive function to compute the nth Fibonacci number.**
7. Write a Python function `factorial` that calculates the factorial of a given number without recursion.
8. Write a Python function `factorial` that calculates the factorial of a given number using recursion.
9. Define a function `reverse_string` that takes a string as an argument and returns the reversed string.