C++ Functions & Calculator Programming Homework

Date: July 21, 2025
Subject: C++ Programming - Functions and Basic Calculator
Total Questions: 11

Instructions:

- Write complete C++ programs for each question
- Include proper header files and namespace declarations
- Add comments to explain your logic
- Test your programs with sample inputs
- Submit well-formatted code with proper indentation

PART A: FUNCTION-BASED PROGRAMS (Questions 1-10)

Simple Level Questions (Questions 1-6)

Question 1: Write a C++ program using a **function with no parameters and no return value** to display "Welcome to C++ Programming!" on the screen.

Question 2: Create a **function with parameters but no return value** that takes two integers as input and displays their sum.

Question 3: Write a **function with no parameters but with return value** that returns the current year (2025) as an integer.

Question 4: Develop a **function with parameters and return value** that takes two numbers and returns their product.

Question 5: Create a function that takes a number as parameter and checks if it's positive, negative, or zero. Display the result (no return value needed).

Question 6: Write a function that takes a character as parameter and returns 1 if it's a vowel, 0 if it's a consonant.

Medium Level Questions (Questions 7-8)

Question 7: Create a function that takes three integers as parameters and returns the largest among them. Write a main function to test it with user input.

Question 8: Write a function that takes an integer as parameter and returns the factorial of that number. Handle the case for 0! = 1.

Tricky Level Questions (Questions 9-10)

Question 9: Create a function that takes an integer and returns 1 if the number is prime, 0 if it's not prime. A prime number is divisible only by 1 and itself. (Hint: Check divisibility from 2 to square root of the number)

Question 10: Write a function that takes an integer and returns the reverse of that number. For example, if input is 1234, output should be 4321.

PART B: CALCULATOR SYSTEM (Question 11)

Question 11: Design and implement a **Complete Calculator System** using functions in C++.

Requirements:

- Create separate functions for each operation:
  - `add(float a, float b)` - returns sum
  - `subtract(float a, float b)` - returns difference
  - `multiply(float a, float b)` - returns product
  - `divide(float a, float b)` - returns quotient (handle division by zero)
  - `modulus(int a, int b)` - returns remainder (handle division by zero)

Features to implement:

1. Display a menu showing all available operations
2. Accept user choice and two numbers
3. Call appropriate function based on user choice
4. Display the result
5. Ask if user wants to perform another calculation
6. Handle invalid inputs gracefully

Sample Output:

```
===== CALCULATOR MENU =====
1. Addition (+)
2. Subtraction (-)
3. Multiplication (*)
4. Division (/)
5. Modulus (%)
6. Exit
========================

Enter your choice (1-6): 1
Enter first number: 15.5
Enter second number: 10.2
Result: 15.5 + 10.2 = 25.7

Do you want to continue? (y/n): y
```

Submission Guidelines:

1. Write each program in a separate `.cpp` file
2. Name files as: `question1.cpp`, `question2.cpp`, etc.
3. Include proper documentation and comments
4. Test each program thoroughly
5. Submit all files in a single folder named "YourName_CPP_Homework"

Learning Objectives:

By completing this homework, you will master:

- Function declaration and definition
- Parameter passing techniques
- Return value handling
- Menu-driven programming
- Basic error handling
- Code organization and structure

Good Luck with your programming practice!