Assignment 1: Product Inventory and Conditional Compilations
Mapped on CLO2
Deadline: 18th February
Total Marks: 20

Question 1:

In this assignment, you will create a Product Inventory Management System using C++ that utilizes structures and conditional compilations to handle different scenarios. The system will allow users to perform operations such as adding new products, calculating total stock value, and generating sales reports. Conditional compilation will enable different features based on compile-time directives. Apply the following:

Requirements:

1. **Product Structure:**

Define a structure named Product with the following members:

- productID (integer): Unique identifier for each product.
- name (string): Name of the product.
- category (string): Product category (e.g., Electronics, Clothing, etc.).
- price (float): Price per unit of the product.
- stockQuantity (integer): Quantity of the product in stock.
- discount (float): Discount percentage applicable on the product.
- revenueGenerated (float): Revenue generated from sales of the product.

---

2. **Conditional Compilation:**

Use conditional compilation directives to enable or disable additional features, such as:

- Calculating total stock value: (define CALCULATE_STOCK_VALUE) Calculate the total value of the available stock for each product by multiplying price and stockQuantity.

- Applying Discounts: (define ENABLE_DISCOUNTS)
  Calculate the final price of products after applying the given discount percentage.
- Generating Sales Reports: (define GENERATE_SALES_REPORT)
  Summarize total revenue generated for all products.

---

3. **Functionality:**

- Add a New Product:
  Implement a function to add a new product to the system, prompting the user to input all relevant details.
- Display Product Details:
  Implement a function to display the details of a specific product based on its ID.
- Calculate Total Stock Value:
  If the CALCULATE_STOCK_VALUE directive is defined, implement a function to calculate and display the total stock value of all products.
- Apply Discounts:
  If the ENABLE_DISCOUNTS directive is defined, apply a discount and display the updated price for each product.
- Generate Sales Report:
  If the GENERATE_SALES_REPORT directive is defined, implement a function to display a summary of revenue generated for all products.

Question 2:

Analyse the uploaded shoppingCart.cpp code and provide a detailed understanding of its working. For bonus points, develop a similar shopping simulation game where users can add products to their cart, apply discounts, and checkout.

Submission Guidelines:

- Submit a well-commented C++ source code file (.cpp) along with a Word (.doc) document containing the code and snapshots of your output.
- Save the file with your name and registration number.

- Use conditional compilation directives (#ifdef, #ifndef, #endif) to selectively enable or disable features based on compile-time options.
- Avoid plagiarism. DO IT ON YOUR OWN.
- You are free to use AI tools but try to develop your own understanding from it.