Advanced SQL

Assignment Questions

PW SKILLS

Q1. What is a Common Table Expression (CTE), and how does it improve SQL query readability?

Q2. Why are some views updatable while others are read-only? Explain with an example.

Q3. What advantages do stored procedures offer compared to writing raw SQL queries repeatedly?

Q4. What is the purpose of triggers in a database? Mention one use case where a trigger is essential.

Q5. Explain the need for data modelling and normalization when designing a database.

Dataset (Use for Q6–Q9)

```sql
CREATE TABLE Products (
    ProductID INT PRIMARY KEY,
    ProductName VARCHAR(100),
    Category VARCHAR(50),
    Price DECIMAL(10,2)
);

INSERT INTO Products VALUES
(1, 'Keyboard', 'Electronics', 1200),
(2, 'Mouse', 'Electronics', 800),
(3, 'Chair', 'Furniture', 2500),
(4, 'Desk', 'Furniture', 5500);

CREATE TABLE Sales (
    SaleID INT PRIMARY KEY,
    ProductID INT,
    Quantity INT,
    SaleDate DATE,
    FOREIGN KEY (ProductID) REFERENCES Products(ProductID)
);

INSERT INTO Sales VALUES
(1, 1, 4, '2024-01-05'),
(2, 2, 10, '2024-01-06'),
(3, 3, 2, '2024-01-10'),
(4, 4, 1, '2024-01-11');
```

Q6. Write a CTE to calculate the total revenue for each product (Revenues = Price × Quantity), and return only products where revenue > 3000.

Q7. Create a view named vw_CategorySummary that shows: Category, TotalProducts, AveragePrice.

Q8. Create an updatable view containing ProductID, ProductName, and Price. Then update the price of ProductID = 1 using the view.

Q9. Create a stored procedure that accepts a category name and returns all products belonging to that category.

Q10. Create an AFTER DELETE trigger on the `Products` table that archives deleted product rows into a new table `ProductArchive`. The archive should store ProductID, ProductName, Category, Price, and DeletedAt timestamp.