

Question 1: Object-Oriented Programming (40 Marks)

You are tasked with implementing a simple banking system in C++. Design and implement the necessary classes to represent the following entities:

1. BankAccount: A class to represent a bank account with attributes such as account number, account holder name, balance, and account type (savings or current).
2. Transaction: A class to represent a transaction with attributes such as transaction ID, transaction type (deposit or withdrawal), amount, and date/time of transaction.
3. Write member functions for the BankAccount class to perform operations like deposit, withdrawal, and display account details.
4. Implement error handling for scenarios such as insufficient balance during withdrawal.
5. Create a menu-driven program to interact with these classes allowing users to perform operations like deposit, withdrawal, and display account details.

Question 2: Data Structures and Algorithms (30 Marks)

Implement a C++ program to perform the following tasks:

1. Create a structure to represent a student with attributes such as roll number, name, age, and marks in three subjects (Mathematics, Physics, and Chemistry).
2. Implement functions to:
 - Insert a new student record.
 - Display details of all students.
 - Search for a student by roll number and display their details.
 - Compute and display the average marks of all students.
 - Display the details of the student scoring the highest marks in Mathematics.
3. Use appropriate data structures such as arrays or linked lists to store student records efficiently.

Question 3: File Handling and Exception Handling (30 Marks)

Write a C++ program that reads data from a text file containing employee records. Each record consists of employee ID, name, designation, and salary. Implement the following tasks:

1. Read the employee records from the file and display them on the console.
2. Sort the employee records based on their salary in ascending order.
3. Write the sorted records back to a new text file.
4. Implement error handling to handle file-related exceptions such as file not found or file read/write errors.