Assignment: *Black-Box Test Design Techniques*

Objective

The purpose of this assignment is to strengthen your understanding and practical application of black-box testing techniques, namely:

- Boundary Value Analysis (BVA)
- Equivalence Partitioning (EP)
- State Transition Testing (STT)
- Decision Table Testing (DTT)

Instructions

1. Answer each question clearly.
2. For each problem, identify test conditions and design appropriate test cases
3. Where required, present your work in a tabular format (test case ID, input, expected output, etc.)
4. Submit a Doc or, preferably, a PDF through the Google Form.
5. Do not take help from others or the internet — this is a test of your own creativity and thinking.

Part A: Individual Technique Problems

Problem 1: Boundary Value Analysis (BVA)

A system accepts an input integer age between 18 and 60 (inclusive).

- If age < 18 → “Not eligible”
- If 18 ≤ age ≤ 60 → “Eligible”
- If age > 60 → “Not eligible”

Task:
Design test cases using Boundary Value Analysis (BVA).

Problem 2: Equivalence Partitioning (EP)

An e-commerce website offers free shipping if the purchase amount is between $50 and $500 (inclusive).

- If purchase < 50 → “Shipping charge applicable”
- If 50 ≤ purchase ≤ 500 → “Free shipping”
- If purchase > 500 → “Special handling required”

Task:
Design test cases using Equivalence Partitioning (EP).

Problem 3: State Transition Testing (STT)

A login system allows up to 3 unsuccessful login attempts:

- On 1st or 2nd failed attempt → “Retry allowed”
- On 3rd failed attempt → “Account locked”
- On successful login → “Welcome”

Task:
Draw a state transition diagram and design test cases using State Transition Testing (STT).

Problem 4: Decision Table Testing (DTT)

A student grading system works as follows:

- If attendance ≥ 75% AND exam score ≥ 40 → “Pass”
- If attendance < 75% AND exam score ≥ 40 → “Repeat Course”
- If attendance ≥ 75% AND exam score < 40 → “Supplementary Exam”
- If attendance < 75% AND exam score < 40 → “Fail”

Task:
Construct a decision table and derive test cases using Decision Table Testing (DTT).

Part B: Combined Technique Problem

Problem 5: Comprehensive Application

A banking application accepts loan applications under the following rules:

- Applicant's age must be between 21 and 65 (inclusive).
- Applicant's monthly income must be at least BDT 25,000.
- If both conditions are met, system checks credit score:
    - Credit Score ≥ 700 → "Loan Approved"
    - Credit Score 500–699 → "Loan Pending Review"
    - Credit Score < 500 → "Loan Rejected"

Task:

1. Apply BVA on age and income ranges.
2. Apply EP to classify income and credit score ranges.
3. Use STT to model the application process (from "Application Submitted" to final decision).
4. Use DTT to cover combinations of age, income, and credit score.