Assignment: Black-Box Test Design Techniques

Part A: Individual Technique Problems

Problem 1: Boundary Value Analysis (BVA)

System: Age input between **18–60 (inclusive)**.

- Age < 18 → "Not eligible"
- 18 ≤ Age ≤ 60 → "Eligible"
- Age > 60 → "Not eligible"

Test Case ID	Input (AGE)	Expected Output
TC01	17	Not Eligible
TC02	18	Eligible
TC03	19	Eligible
TC04	59	Eligible
TC05	60	Eligible
TC06	61	Not Eligible

Problem 2: Equivalence Partitioning (EP)

System: Free shipping between **$50–500 (inclusive)**.

- Purchase < 50 → "Shipping charge applicable"
- 50 ≤ Purchase ≤ 500 → "Free shipping"
- Purchase > 500 → "Special handling required"

Test Case ID	Partition	Input	Expected Output
TC01	< 50	47	Shipping charge applicable
TC02	50 - 500	250	Free shipping
TC03	> 500	510	Special handling required

Problem 3: State Transition Testing (STT)

System: Login attempts.

- 1st or 2nd fail → "Retry allowed"
- 3rd fail → "Account locked"
- Success → "Welcome"

Test Case ID	Pre-Condition	Input	Expected Result	Actual Result	Pass	Fail
TC01	Fresh login	Success	Welcome	Welcome	yes	no
TC02	Fresh login	Fail → Success	Retry Allowed → Welcome	Same as expected	yes	no
TC03	Fresh login	Fail → Fail → Success	Retry Allowed → Retry Allowed → Welcome	Same as expected	Yes	no
TC04	Fresh login	Fail → Fail → Fail	Retry Allowed → Retry Allowed → Account locked	Same as expected	yes	no
TC05	Fresh login	Fail → Fail → Fail → success	Retry Allowed → Retry Allowed → Account locked → Remains locked	Remains locked	yes	no
TC06	Fresh login	Fail → Fail → Fail → Fail	Retry Allowed → Retry Allowed → Account locked → Remains locked	Remains locked	yes	no
TC07	Fresh login	Success → Fail	Should reset after success → Fail should reset new session	System continued same session	No	yes

TC08	Fresh login	Fail → Success → Fail	Should reset after success → New session	System continued same session	No	Yes
TC09	Fresh login	Success → Success	Each should be independent sessions → Welcome, Welcome	System did not reset properly	No	yes
TC10	have been 2 previous failed attempts.	Fail	Third fail should lock account → Account locked	Account locked	Yes	no
TC11	Account locked	Success	Should remain locked → No login	System displayed Account locked	Yes	no
TC12	Account locked	Fail	Should remain locked → Account locked	Same as expected	Yes	No
TC13	Continuous wrong attempts (5+)	Fail 5 times	Lock should occur after 3rd attempt and remain locked	Locked after 3rd, remained locked	Yes	No
TC14	Random mixed sequence	Fail → Success → Fail → Fail → Success	Each success resets session → Never lock	welcome	Yes	no

Problem 4 — Decision Table Testing (DTT)

System: Student grading system
Rules:

- 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**

TC ID	Pre-condition	Inputs (attendance %, exam score)	Expected Result	Actual Result	Remarks
TC1 (R1-basic)	Normal	80, 50	**Pass**		Attendance ≥75 & score ≥40
TC2 (R2-basic)	Normal	70, 50	**Repeat Course**		Attendance <75 & score ≥40
TC3 (R3-basic)	Normal	85, 30	**Supplementary Exam**		Attendance ≥75 & score <40
TC4 (R4-basic)	Normal	60, 30	**Fail**		Attendance <75 & score <40
TC5 (boundary-attendance-low)	Boundary	75, 40	**Pass**		Both exactly on boundary → expected Pass
TC6 (boundary-attendance-just-below)	Boundary	74.99, 40	**Repeat Course**		Slightly below 75 → Repeat Course
TC7 (boundary-score-just-below)	Boundary	75, 39.99	**Supplementary Exam**		Score just below 40 → Supp. Exam
TC8 (boundary-score-exact)	Boundary	75, 40.0	**Pass**		explicit float equality check
TC9 (max-values)	Robustness	100, 100	**Pass**		perfect attendance & score
TC10 (min-values)	Robustness	0, 0	**Fail**		zero attendance and score
TC11 (negative-attendance)	Robustness (invalid)	-5, 50	**Invalid Input / Reject** (treat as error)		system should validate input —

					expected: validation error
TC12 (attendance>100)	Robustness (invalid)	120, 50	**Invalid Input / Reject**		invalid attendance percent
TC13 (score negative)	Robustness (invalid)	80, -1	**Invalid Input / Reject**		invalid score
TC14 (score >100)	Robustness (invalid)	80, 150	**Invalid Input / Reject**		invalid score
TC15 (decimal-attendance)	Data type check	75.0, 40	**Pass**		ensure system handles decimals correctly
TC16 (decimal-score)	Data type check	80, 39.9999	**Supplementary Exam**		floating precision handling
TC17 (trim/spaces input)	Input sanitation	" 75 ", " 40 "	**Pass**		input with whitespace — should be trimmed
TC18 (string numeric)	Input sanitation	"75", "40"	**Pass**		numeric strings — depending on spec should be accepted or validated
TC19 (missing attendance)	Negative / validation	null, 50	**Invalid Input / Reject**		missing attendance should be handled
TC20 (missing score)	Negative / validation	80, null	**Invalid Input / Reject**		missing score should be handled