ATM

Card Insertion

Positive Test Cases

- Valid card with correct orientation (chip side facing up).
- Valid card inserted in contactless mode.
- Valid card inserted after language selection.
- The card was successfully read after multiple failed attempts.

Negative Test Cases

- Insert expired card.
- Insert blocked or stolen card.
- Insert card upside down or backward.
- Insert a card from an unsupported bank.
- Insert a damaged card (e.g., broken chip or demagnetized).
- Insert a foreign card not belonging to the same bank.
- Insert multiple cards at once.
- Insert a card, then remove it abruptly during reading.
- Insert a card, then cancel the transaction midway.
- Insert a valid card, but the ATM is out of order.

PIN Validation

Positive Test Cases

- Correct PIN entered on the first attempt.
- Correct PIN entered after an incorrect attempt.
- Correct PIN entered after a delay (system timeout).
- Correct PIN entered after selecting a specific account type (e.g., Savings/Checking).

Negative Test Cases

- Enter incorrect PIN once, twice, and three times.
- Enter fewer than the required digits (e.g., 3 digits for a 4-digit PIN).
- Enter more than the required number of digits.
- Enter alphanumeric characters (if the keypad allows).
- Enter correct PIN after multiple wrong attempts (account lock).
- Enter PIN with special characters or spaces (if possible).
- Enter PIN when the card is blocked or expired.
- Enter incorrect PIN after system timeout.
- Enter PIN when the ATM system is down (network failure).

Account Type Selection (Savings, Checking, Credit)

Positive Test Cases

- Select Savings account.
- Select Checking account.

- Select Credit Card account.

Negative Test Cases
- Try to proceed without selecting an account type.
- Select an invalid account type (e.g., select "Credit" for a card with no credit option).
- Cancel during account type selection.
- Account selection when account is locked or frozen.
- Select account when the ATM is in offline mode.

Balance Inquiry

Positive Test Cases

- Perform balance inquiry for a valid savings account.
- Perform balance inquiry for a valid checking account.

Negative Test Cases
- Balance inquiry when the account is frozen.
- Balance inquiry for an account with a zero balance.
- Inquiry during network failure.
- Inquiry without selecting an account type.
- Inquiry with an expired card.
- Inquiry with a damaged card.
- Inquiry with an unsupported card type (e.g., a foreign card).
- Timeout during balance inquiry before balance is displayed.
- Balance inquiry after multiple failed PIN attempts (locked account).

Cash Withdrawal

Positive Test Cases
- Withdraw an amount within the daily withdrawal limit.
- Withdraw an amount within the available account balance.
- Withdraw in different denominations (e.g., PKR 1000, PKR 5000, and PKR 10000).

Negative Test Cases
- Withdraw an amount exceeding daily withdrawal limits.
- Withdraw more than the available account balance.
- Withdraw an invalid amount (e.g., PKR 7000 if only PKR 5000 / PKR 10000 denominations are available).
- Withdraw when the ATM is out of cash.
- Withdraw without selecting an account type.
- Withdraw using a blocked or expired card.
- Withdraw multiple times until balance is exceeded.
- Withdraw with network connectivity issues.
- Cancel withdrawal after entering the amount.
- Withdraw with damaged or unreadable card.
- Withdraw from an account with insufficient balance.

Funds Transfer

Positive Test Cases

- Transfer funds between accounts within the same bank.
- Transfer funds to an external account (another bank).
- Transfer within the allowed daily limit.

Negative Test Cases

- Transfer exceeding daily limit.
- Transfer to an invalid account number.
- Transfer more than the available balance.
- Transfer between unsupported account types (e.g., from credit card to savings).
- Transfer with invalid routing details (external bank).
- Transfer during network outage.
- Cancel transaction midway after entering the transfer amount.
- Attempt transfer with frozen/blocked accounts.
- Timeout during fund transfer input.

Deposit

Positive Test Cases

- Deposit cash into savings/checking account.
- Deposit check into account (if feature is supported).
- Deposit within the allowed daily limit.

Negative Test Cases

- Deposit exceeding the daily deposit limit.
- Deposit a damaged check.
- Deposit without selecting an account.
- Cancel deposit midway after inserting cash.
- Deposit into a closed/frozen account.
- Attempt deposit when ATM deposit tray is jammed.
- Attempt deposit during network failure.
- Deposit with counterfeit or unreadable cash (if ATM can detect it).

Bill Payment

Positive Test Cases

- Pay utility bills using the ATM.
- Pay credit card bills using the ATM.

Negative Test Cases

- Attempt to pay an invalid bill.
- Pay bills exceeding the allowed transaction limit.
- Pay bills using an invalid account number.
- Bill payment during network failure.
- Timeout during bill payment input.

- Pay bills with insufficient balance.
- Cancel bill payment midway after entering details.

Card Ejection

Positive Test Cases
- Card successfully ejected after transaction completion.
- Card ejected if the transaction is canceled midway.

Negative Test Cases
- Card remains stuck after completing the transaction.
- Card not ejected after canceling the transaction.
- Card not ejected after network failure or ATM crash.
- Card ejected before PIN entry screen (user cancels before entering PIN).

System Performance

Load Testing
- Perform multiple transactions in rapid succession.
- Check ATM response times during peak hours (high load).

Stress Testing
- Test ATM behavior under extreme load (e.g., 100+ consecutive transactions).
- Simulate ATM behavior during server outages (network failure, database failure).

Recovery Testing
- Simulate power failure during a transaction.
- Check for proper recovery after an ATM reboot.

Usability Testing

Positive Test Cases
- Test ATM screen visibility under different lighting conditions.
- Ensure all buttons on the keypad respond correctly.
- Check the ATM interface for different languages.

Negative Test Cases
- Check for unclear messages or instructions.
- Ensure the cancel button works on every screen.
- Test screen resolution and responsiveness for touch-enabled ATMs.

Security Testing

Positive Test Cases
- Ensure encryption for PIN entry.
- Validate secure card reading and writing.

Negative Test Cases

- Test for brute-force attacks (repeated incorrect PIN entries).
- Attempt unauthorized access using foreign objects (e.g., skimming devices).
- Check for vulnerabilities in card reader.
- Test for shoulder surfing (screen readability from various angles).

Other Cases

- Insert a valid card after the ATM has timed out.
- Withdraw an amount that would leave the balance at exactly PKR 0.
- Perform a transaction when the ATM's receipt printer runs out of paper.
- Enter correct PIN after three incorrect attempts on a separate day.
- Perform transactions using international cards (different currencies, regions).