

# Functional & Performance Testing

**Online Payments Fraud Detection using Machine Learning**

**Date: 20 Feb 2026**

**Team ID: LTVIP2026TMIDS65668**

**Project Name: Online Payments Fraud Detection using Machine Learning**

**Maximum Marks: 4 Marks**

## Test Scenarios & Results – Online Payments Fraud Detection

| Test Case ID | Scenario (What to test)          | Test Steps (How to test)                                      | Expected Result  | Actual Result                     | Pass/Fail |
|--------------|----------------------------------|---|--|-----------------------------------|-----------|
| FT-01        | Validation – Transaction Details | Enter valid and invalid values (amount, balances, type)       | Valid numeric inputs accepted; error shown for invalid or empty fields | Validation working correctly      | Pass      |
| FT-02        | Fraud Prediction Output          | Enter valid transaction details and click “Predict”           | System displays Fraud / Not Fraud correctly                            | Prediction generated successfully | Pass      |
| FT-03        | Model Integration                | Submit transaction data via Flask app                         | Backend model processes input and returns prediction                   | Model integrated successfully     | Pass      |
| FT-04        | Error Handling                   | Enter empty fields or non-numeric values                      | Application displays “Invalid Input” message                           | Proper error message displayed    | Pass      |
| FT-05        | Transaction Type Encoding        | Select different transaction types (TRANSFER, CASH_OUT, etc.) | Correct encoding applied before prediction                             | Encoding handled correctly        | Pass      |
| PT-01        | Response Time Test               | Measure time taken after clicking “Predict”                   | Prediction generated   | Average response time ≈ 1.5 sec   | Pass      |

| Test Case ID | Scenario (What to test) | Test Steps (How to test)                            | Expected Result                                 | Actual Result                         | Pass/Fail                           |
|--------------|-------------------------|---|---|---------------------------------------|-------------------------------------|
| PT-02        | Model Load Test         | Run 50–100 consecutive predictions                  | within 3 seconds                                | System handles requests without crash | No performance degradation observed |
| PT-03        | Concurrent User Test    | Simulate multiple user inputs simultaneously        | System remains stable                           | Stable under moderate load            | Pass                                |
| PT-04        | UI Functionality        | Navigate between home page and prediction dashboard | Pages load correctly; buttons function properly | UI working as expected                | Pass                                |
| PT-05        | Security Validation     | Try invalid data injection in input fields          | System prevents malicious input                 | Input sanitization successful         | Pass                                |

### Performance Summary

- Prediction Time: ~1.5 seconds
- Model Stability: Stable under moderate load
- Error Handling: Proper validation implemented
- System Reliability: High

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### Conclusion

The Online Payments Fraud Detection System successfully passed both functional and performance testing. The application:

- Accurately predicts fraudulent transactions
- Handles invalid inputs effectively
- Maintains fast response time
- Remains stable under multiple requests

The system is ready for final deployment and submission.