**System Testing Document: Student Referral & Tier Reward System**

**1. Overview**

This document outlines the testing strategy and detailed test cases used to validate the Student Referral & Tier Reward System. It ensures all functional and non-functional requirements described in the SRS are met.

**2. Objectives**

* Verify correctness of referral submission, conversion, and tier calculation
* Validate point allocation and revocation logic
* Confirm proper functioning of user and admin dashboards
* Test file upload, validation, and report generation
* Ensure UI responsiveness and session security

**3. Test Environment**

* **Frontend**: HTML, JavaScript
* **Backend**: Python (Flask), JSON storage
* **Test Tools**: Manual testing, CSV templates
* **Browsers**: Chrome, Firefox, Edge

**4. Test Case Matrix**

**4.1 Authentication & Session**

| **TC ID** | **Title** | **Description** | **Input** | **Expected Result** |
| --- | --- | --- | --- | --- |
| TC-A1 | Login Success | Valid user login | Valid credentials | Redirect to dashboard |
| TC-A2 | Login Failure | Invalid login | Wrong credentials | Error message |
| TC-A3 | Session Timeout | Auto logout | Wait 16 mins | Session ends |

**4.2 Referral Management**

| **TC ID** | **Title** | **Description** | **Input** | **Expected Result** |
| --- | --- | --- | --- | --- |
| TC-R1 | Submit Referral | Form-based referral | Unique referral data | Saved, +50 points |
| TC-R2 | Duplicate Referral | Submit duplicate | Same phone/email | Error message |
| TC-R3 | CSV Upload - Valid | Upload 3 valid rows | Formatted CSV | All accepted |
| TC-R4 | CSV Upload - Partial Fail | Mixed row quality | Valid + invalid | Rejects bad row only |

**4.3 Points System**

| **TC ID** | **Title** | **Description** | **Input** | **Expected Result** |
| --- | --- | --- | --- | --- |
| TC-P1 | Referral Points | Award for referral | Form input | +50 points |
| TC-P2 | Conversion Points | Convert referral | Admission ₹50k | +750 points |
| TC-P3 | Manual Point Add | Admin adds points | +100, reason: bonus | Total increases |
| TC-P4 | Rejected Referral | Admin rejects | Any referral | Points removed |

**4.4 Tier Evaluation**

| **TC ID** | **Title** | **Description** | **Input** | **Expected Result** |
| --- | --- | --- | --- | --- |
| TC-T1 | Auto Upgrade | Reach 10K pts | Submit referrals | Tier = Silver |
| TC-T2 | Downgrade Warning | Drop warning | Simulated drop | Warning shown |
| TC-T3 | Downgrade Action | Tier reduction | Below threshold | Tier drops |

**4.5 CSV Uploads**

| **TC ID** | **Title** | **Description** | **Input** | **Expected Result** |
| --- | --- | --- | --- | --- |
| TC-C1 | Valid User CSV | Admin upload | Valid 3 users | All created |
| TC-C2 | Invalid Password | Weak password | Invalid row | Rejected row only |
| TC-C3 | Duplicate Username | Re-upload existing | CSV with same ID | Error for duplicate |
| TC-C4 | Bad Format | Wrong column headers | Bad CSV | Upload blocked |

**4.6 Admin Features**

| **TC ID** | **Title** | **Description** | **Input** | **Expected Result** |
| --- | --- | --- | --- | --- |
| TC-AD1 | Create User | Admin creates user | All fields | User created |
| TC-AD2 | Edit Referral | Modify data | Change interest | Referral updated |
| TC-AD3 | Convert Referral | Update status | Mark converted | Adds 250 + bonus |
| TC-AD4 | Reject Referral | Mark as rejected | Status: Rejected | Points deducted |

**4.7 Reporting & Logs**

| **TC ID** | **Title** | **Description** | **Input** | **Expected Result** |
| --- | --- | --- | --- | --- |
| TC-RP1 | Weekly Report | Download report | Past 7 days | CSV generated |
| TC-RP2 | Custom Report | Select range | Custom dates | Filtered data |
| TC-RP3 | Action Logs | Verify logs | Check logs.json | Logs accurate |
| TC-RP4 | Tier Logs | Tier changes | Weekly run | Log entries present |

**4.8 UI & Non-Functional**

| **TC ID** | **Title** | **Description** | **Input** | **Expected Result** |
| --- | --- | --- | --- | --- |
| TC-NF1 | Responsive UI | Resize screen | Mobile & Desktop | Adjusts correctly |
| TC-NF2 | CSV Template | Sample file | Click download | File downloads |
| TC-NF3 | Error Feedback | Submit blank form | Missing data | Client-side error |
| TC-NF4 | Password Validation | Weak password | 6-char lower | Error shown |

**5. Execution Notes**

* Use known test users for login (admin, testuser1)
* Simulate conversions using real numbers (e.g., ₹50,000)
* Reset JSON files after each major test to revalidate edge cases

**6. Test Completion Criteria**

* 100% of functional test cases pass
* All invalid inputs are rejected as expected
* All referrals route properly through lifecycle
* Tier system behaves per weekly point window

**7. Conclusion**

This test suite ensures comprehensive coverage of your referral system and confirms alignment with the original SRS. It supports manual test execution and can be automated later using Python scripts or Postman collection.

**End of Testing Document**