Software Testing Document

for

RIT Placement Management System

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1 Scope of Testing

The RIT Placement Management System testing ensures that all core functionalities work correctly and meet user expectations. The following types of testing will be conducted:

1.1 Functional Testing

Verifying that each feature works as expected:

1.1.1 Admin Features

- Admin login and authentication.
- Uploading student details via an Excel sheet.
- Registering companies.
- Creating and managing placement drives.
- Collecting and exporting student registration lists.
- Uploading round results from recruiters via Excel sheets.

1.1.2 Student Features

- Registering on the placement portal (OTP verification, password setup, resume upload).
- Logging in to the system.
- Viewing eligible placement drives.
- Registering for one or more drives.
- Receiving result notifications via registered RIT email.
- Viewing and updating profile information.

1.1.3 Chatbot Functionality

- Answering student queries about placements.

1.2 UI Testing

Ensuring the web interface is user-friendly and responsive across devices:

- Proper rendering of pages and forms.
- Consistency in layout, fonts, and colors.
- Responsive design for different screen sizes.

1.3 Security Testing

Ensuring the system is secure and prevents unauthorized access:

- **Authentication Testing:** Secure login with JWT.
- **Authorization Testing:** Role-based access control for admins and students.
- **Data Encryption:** Secure password storage using Bcrypt.

1.4 Database Testing

Verifying data integrity and correctness in PostgreSQL:

- Checking database constraints and relationships.

- Validating correct storage of student registrations, results, and drive details.

2 Testing Environment

2.1 Hardware Specifications

Client Devices: Laptops, desktops, tablets, and smartphones.

- Minimum Requirements:

  - 4 GB RAM, dual-core processor, 1280x720 display resolution.

  Server:

- Cloud-hosted (Render/AWS).

- 16 GB RAM, SSD storage, multi-core processor.

2.2 Software Specifications

Operating System:

- Server: Ubuntu 20.04 LTS or similar.

- Client: Windows/macOS/Linux.

  Browser Compatibility:

- Chrome, Firefox, Safari, Edge (latest versions).

  Technology Stack:

- Backend: Node.js + Express.js.

- Database: PostgreSQL with PgAdmin.

- Frontend: React.js with Tailwind CSS.

- Authentication: JWT-based authentication, Bcrypt for password hashing.

- File Uploads: Multer + Cloudinary for resume storage.

- Email Notifications: Nodemailer for OTP verification and result updates.

- Testing Tools: Postman for API testing.

  Protocols
  Communication:

- RESTful API communication.

- HTTPS for secure data transmission.

3 Types of Testing Conducted (Testing Strategy)

3.1 Unit Testing

- Testing individual backend functions and API endpoints.

- Ensuring correct authentication, database queries, and file uploads.

3.2 Integration Testing

- Testing interactions between different modules (e.g., student registration with OTP verification).

- Ensuring proper connection between frontend and backend.

3.3 System Testing

- Validating end-to-end workflows (e.g., student registration to result publishing).

- Ensuring seamless navigation across the portal.

3.4 User Acceptance Testing (UAT)

- Conducted by students and placement officers.

- Ensuring the system meets user needs before deployment.

3.5 Regression Testing

- Re-testing core functionalities after updates or bug fixes.

This document will be followed by Test Cases and Bug Reports to track and validate testing results.

4 Test Cases

4.1 student registration

Test Case ID	Test Scenario	Test Steps	Expected Output	Actual Output	Status
TC01	Register with valid details	Enter valid KTU ID, email, OTP, password, and upload resume	Account created, profile autofilled, redirected to dashboard	Account created, profile autofilled, redirected to dashboard	PASS
TC02	Register with invalid OTP	Enter incorrect OTP	Error message: "Invalid OTP"	Error message: "Invalid OTP"	PASS
TC03	Register with an already registered email	Enter an email that is already in use	Error message: "Email already registered"	Error message: "Email already registered"	PASS
TC04	KTU ID autofill test	Enter valid KTU ID	Name, branch, CGPA autofetched from database	Name, branch, CGPA autofetched from database	PASS
TC05	KTU ID does not exist	Enter an invalid KTU ID	Error: "Invalid KTU ID"	Error: "Invalid KTU ID"	PASS
TC06	Resume upload success	Upload a valid PDF file	File uploaded successfully	File uploaded successfully	PASS
TC07	Resume upload invalid format	Upload a .jpg file instead of PDF	Error: "Only PDF files allowed"	Error: "Only PDF files allowed"	PASS
TC08	Resume upload exceeds size limit	Upload a 10MB PDF file	Error: "File size exceeds limit"	Error: "File size exceeds limit"	PASS

4.2   4.2 Student Login and Viewing Drives

Test Case ID	Test Scenario	Test Steps	Expected Output	Actual Output	Status
TC10	Successful login	Enter valid credentials	Redirected to student dashboard	Redirected to student dashboard	PASS
TC11	Login with incorrect password	Enter incorrect password	Error message: "Invalid credentials"	Error: "Invalid credentials"	PASS
TC12	Login with unverified email	Try logging in before OTP verification	Error: "Invalid credentials"	Error: "Invalid credentials"	PASS
TC13	View eligible On-Campus drives	Navigate to "On-Campus Drives" section	List of eligible drives displayed	List of eligible drives displayed	PASS
TC14	View eligible Off-Campus drives	Navigate to "Off-Campus Drives" section	List of eligible drives displayed	List of eligible drives displayed	PASS

4.3 4.3 Eligibility for Placement Drives

Test Case ID	Test Scenario	Test Steps	Expected Output	Actual Output	Status
TC15	CGPA meets criteria	Enter CGPA ≥ minimum required	Drive appears in eligibility list	Drive appears in eligibility list	PASS
TC16	CGPA below criteria	Enter CGPA < required	Drive not visible	Drive not visible	PASS
TC17	No backlogs allowed	Apply with zero backlogs	Eligible for drive	Eligible for drive	PASS
TC18	Backlogs present (not allowed)	Apply with active backlogs	Drive not visible	Drive not visible	PASS
TC19	Supply history allowed	Apply with past supply history (if permitted)	Drive is available	Drive is available	PASS
TC20	Already placed in two companies	Register for another drive	Not possible. No more eligible drives appear	Not possible. No more eligible drives appear	PASS

4.4   4.4 Placement Drive Categories (Dream, Open, IT, Core)

Test Case ID	Test Scenario	Test Steps	Expected Output	Actual Output	Status
TC21	Placed in Dream company	Try to apply for Open, IT, Core	Only Core drives are visible	Only Core drives are visible	PASS
TC22	Placed in Core company	Try to apply for another drive	Dream category visible	Dream category visible	PASS
TC23	Placed in IT company	Try to apply for another drive	Core & Dream categories available	Core & Dream categories available	PASS
TC24	Placed in Open company	Try to apply for any category	All categories visible	All categories visible	PASS

4.5   4.5 Student Registration for Drives

Test Case ID	Test Scenario	Test Steps	Expected Output	Actual Output	Status
TC25	Register for an eligible drive	Click "Register" on an eligible drive	Registration successful	Registration successful	PASS
TC26	Register after deadline	Try registering after 2-day deadline	If deadline passed then such drives will not appear in eligible drives section	If deadline passed then such drives will not appear in eligible drives section	PASS

4.6 4.6 Viewing Placement Drive Details & Round Information

Test Case ID	Test Scenario	Test Steps	Expected Output	Actual Output	Status
TC27	View placement drive details	Click on a drive name	Drive details displayed	Drive details displayed	PASS
TC28	View round details	Click on a registered drive	Round-wise details displayed	Round-wise details displayed	PASS

4.7 4.7 Viewing Placement Results

Test Case ID	Test Scenario	Test Steps	Expected Output	Actual Output	Status
TC29	View results of completed rounds	Click "View Results"	Results displayed	Results displayed	PASS
TC30	Result status: Pass	If student clears round	Status: "Pass"	Status: "Pass"	PASS
TC31	Result status: Fail	If student fails round	Status: "Fail"	If student fails round	Status: "Fail"
PASS					
TC32	Result status: Pending	If round results are not uploaded yet	Status: "Pending"	Status: "Pending"	PASS
TC33	View success percentage	Check results summary	Success percentage displayed	Success percentage displayed	PASS
TC34	View overall result summary	Click "View Summary"	Summary of all rounds shown	Summary of all rounds shown	PASS

4.8   Admin Login

Test Case ID	Test Scenario	Test Steps	Expected Output	Actual Output	Status
TC35	Successful Login	Enter valid credentials	Redirected to admin dashboard	Redirected to admin dashboard	PASS
TC36	Login with Incorrect Password	Enter valid email and incorrect password	Error message: "Invalid credentials"	Error message: "Invalid credentials"	Pass
TC37	Login with Unregistered Email	Enter an unregistered email	Error message: "Admin account not found"	Error message: "Admin account not found"	Pass
TC38	Login with Empty Fields	Leave email/password field empty	Error message: "Email and Password are required"	Error message: "Email and Password are required"	Pass
TC39	Admin remains logged in after a page refresh.	1. Log in as an admin successfully. 2. Refresh the page.	Admin remains logged in.	Admin remains logged in	pass
Pass					

4.9 Admin Filtering Students

Test Case ID	Test Scenario	Test Steps	Expected Output	Actual Output	Status
TC40	Filter by Department	Select "Department = CSE"	List of CSE students displayed	List of CSE students displayed	Pass
TC41	Filter by Minimum CGPA	Enter "Minimum CGPA = 6.5"	Students with CGPA 6.5 displayed	Students with CGPA 6.5 displayed	Pass
TC42	Filter by Number of Backlogs	Enter "No. of Backlogs = 0"	Students with zero backlogs displayed	Students with zero backlogs displayed	Pass
TC43	Filter by Placement Status	Select "Placed = false"	List of unplaced students displayed	List of unplaced students displayed	Pass
TC44	Filter by Graduation Year	Enter "Graduation Year = 2026"	Students graduating in 2026 displayed	Students graduating in 2026 displayed	Pass
TC45	Filter by No Supply History	Select "No Supply History = true"	Students with no supply history displayed	Students with no supply history displayed	Pass
TC46	Apply Multiple Filters	Apply multiple filters (Department, CGPA, Backlogs)	Students meeting all conditions displayed		Pass

4.10 Admin Registering a Company

Test Case ID	Test Scenario	Test Steps	Expected Output	Actual Output	Status
TC47	Register a Company with Valid Details	Enter valid company details (Google, HR contact, email, address, website)	Company registration successful	registered	Pass
TC48	Register with Missing Required Fields	Leave "Company Name" field blank	Error message: "Company Name is required."	not registered	Pass
TC49	Register Duplicate Company	Enter already registered company details	Error message: "Company already registered."	not registered	Pass

4.11 Admin Dashboard

Test Case ID	Test Scenario	Test Steps	Expected Output	Actual Output	Status
TC50	Register a Drive Successfully	Enter valid drive details (Company, Job Role, CGPA, etc.)	Drive registration successful	Drive registration successful	Pass
TC51	Publish Results Successfully	Upload a valid Excel file	Confirmation: "Results successfully published!"	Confirmation: "Results successfully published!"	Pass
TC52	Add Students via Excel File	Upload a valid Excel file	Confirmation: "Student records successfully added!"	Confirmation: "Student records successfully added!"	Pass
TC53	Upload Invalid Student Data	Upload an Excel file with missing or incorrect data	Error messages displayed	Error messages displayed	Pass
TC54	Download Registered Students List	Select a drive and click download	Excel file with student details downloaded	Excel file with student details downloaded	Pass
TC55	No Registered Students for a Drive	Select a drive with no students and click download	Alert: "No registered students for this drive"	Alert: "No registered students for this drive"	Pass

4.12 Managing Registered Companies

Test Case ID	Test Scenario	Test Steps	Expected Output	Actual Output	Status
TC55	View Registered Companies	Log in as Admin, Navigate to "Registered Companies" section	List of all registered companies displayed	Successfully displayed registered companies	Pass
TC56	Update Company Details	Log in, Navigate to "Registered Companies", Click "Edit", Update details, Click "Save"	Company details updated successfully	Company details updated successfully	Pass
TC57	Delete a Registered Company	Log in, Navigate to "Registered Companies", Click "Delete", Confirm deletion	Selected company removed from the list	Company deleted successfully	Pass

4.13 Managing Registered Drives

Test Case ID	Test Scenario	Test Steps	Expected Output	Actual Output	Status
TC58	View Registered Drives	Log in as Admin, Navigate to "Registered Drives" section	List of all registered drives displayed with round details	Successfully displayed registered drives	Pass
TC59	Update Drive Details	Log in, Navigate to "Registered Drives", Click "Edit", Update details, Click "Save"	Drive details updated successfully	Drive details updated successfully	Pass
TC60	Delete a Registered Drive	Log in, Navigate to "Registered Drives", Click "Delete", Confirm deletion	Selected drive removed from the list	Drive deleted successfully	Pass

5   5. Bug Report

Bug ID	Test Case ID	Bug Description	Steps to Reproduce	Expected Result	Actual Result	Status
BUG01	TC04	KTU ID autofill not working	Enter valid KTU ID	Fields should auto-fill	Fields remain empty	Open
BUG02	TC20	Student placed in 2 companies can still register	Apply for 3rd drive	Error message expected	Registration successful	Open
BUG03	TC30	Incorrect result status displayed	View results	Status should match actual outcome	Incorrect status shown	Open