Test Case Specifications

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1.0 Introduction

1.1 Purpose
This test case specification supports the following objective:
I.   To detail the test cases derived from test coverage in Test Design Specification.

1.2 References
The following IEEE standards have been referenced in preparation of this document:
- *IEEE 829-2008 Standard for Software and System Test Documentation.*

The following documents provide the test basis for this test design:
- *System Design Document.*

2.0 Test Cases

2.1 Environment

Tests shall perform on actual devices following the specifications:
- Operating Systems: Windows, macOS, and Linux.
- Web Browser, Mobile App and Desktop App

Web Browser Testing Environment:

Operating System	Windows 10, macOS, Linux
Browsers	Chrome version Firefox version Microsoft Edge version
WebDriver Executables	chromedriver
Dependencies	Java Development Kit (JDK) 11
Automation Software	Selenium version 4.1.0

Desktop App Testing Environment:

Operating System	Windows 10, macOS, Linux
Emulator	VMware Fusion 12.2
Desktop App Version	Rajamark version 1.0
Testing Tool	Java Development Kit (JDK) 11

Mobile App Testing Environment:

Hardware Name	Android 11.0 (Emulator)
Operating System	Android 11.0 (Emulator)
Mobile App Version	Rajamark version 1.0
Testing Framework	

2.2 Test Cases

F001 - Register

Test Case ID	TC-01-001		
Related Feature ID	F001		
Objective	**Register** - user clicks the "Don't have an account? Register here" button.		
Input	**Expected Result**	**Special Procedural Requirements**	**Intercase Dependency**
User clicks the "Don't have an account? Register here" button.	The system should redirect the user to the Register page.	-	-

Test Case ID	TC-01-002		
Related Feature ID	F001		
Objective	**Register** - user fills in all required information.		
Input	**Expected Result**	**Special Procedural Requirements**	**Intercase Dependency**
Username: admin1 Email Address: admin1@gmail.com Password: admin123! Confirm Password: admin123!	The system should create a new record in the account database after validating the account and redirect the user to the Login page after displaying "REGISTRATION SUCCESS" message.	-	-

Test Case ID	TC-01-003
Related Feature ID	F001
Objective	**Register** - user fills in all required information, passwords don't match.

Input	Expected Result	Special Procedural Requirements	Intercase Dependency
Username: admin1 Email Address: admin1@gmail.com Password: admin123! Confirm Password: admin123	The system shall prompt an Error Message "Password does not match".	-	-

Test Case ID	TC-01-004
Related Feature ID	F001
Objective	**Register** - user fills in all required information, username already exists.

Input	Expected Result	Special Procedural Requirements	Intercase Dependency
Username: admin1 Email Address: admin1@gmail.com Password: admin123! Confirm Password: admin123!	The system shall prompt an Error Message "Username Has Existed. Please try again".	-	-

Test Case ID	TC-01-005
Related Feature ID	F001
Objective	**Register** - user fills in all required information, email already exists.

Input	Expected Result	Special Procedural Requirements	Intercase Dependency
Username: admin1 Email Address: admin1@gmail.com Password: admin123! Confirm Password: admin123!	The system shall prompt an Error Message "Email Has Existed. Please try again".	-	-

Test Case ID	TC-01-006
Related Feature ID	F001
Objective	**Register** - user does not fill in all the required information.

Input	Expected Result	Special Procedural Requirements	Intercase Dependency
Username: admin1 // null Email Address: admin1@gmail.com // null Password: admin123! // null Confirm Password: admin123! // null	The system shall prompt an Error Message "Please fill in all the required information".	-	-

F002 - Login

Test Case ID	TC-02-001		
Related Feature ID	F002		
Objective	**Login** - user fills in all required information correctly.		
Input	**Expected Result**	**Special Procedural Requirements**	**Intercase Dependency**
Username // Email: admin1 // admin1@gmail.com Password: admin123!	The system should change status to login after validating login and redirect the user to the Home page.	-	-

Test Case ID	TC-02-002		
Related Feature ID	F002		
Objective	**Login** - user fills in all required information, but they don't match in the database.		
Input	**Expected Result**	**Special Procedural Requirements**	**Intercase Dependency**
Username // Email: admin123 // admin123@gmail.com Password: admin123!	The system shall prompt an Error Message "Username/Email does not exist. Please try again".	-	-
Username: admin1 Password: admin123	The system shall prompt an Error Message "Password is incorrect. Please try again".	-	-

Test Case ID	TC-02-003
Related Feature ID	F002
Objective	**Login** - user does not fill in all the required information.

Input	Expected Result	Special Procedural Requirements	Intercase Dependency
Username // Email: admin1 // admin1@gmail.com // null Password: admin123! // null	The system shall prompt an Error Message "Please fill in all the required information".	-	-

F003 - Logout

Test Case ID	TC-03-001		
Related Feature ID	F003		
Objective	**Logout -** verify successful logout when the user manually clicks the logout button		
Input	**Expected Result**	**Special Procedural Requirements**	**Intercase Dependency**
User clicks on the logout button.	User is logged out of the system and redirected to the login page	-	-

Test Case ID	TC-03-002		
Related Feature ID	F003		
Objective	**Logout -** Ensure proper session termination after a period of inactivity in the website.		
Input	**Expected Result**	**Special Procedural Requirements**	**Intercase Dependency**
User session remains inactive for the configured timeout period.	User is automatically logged out of the system due to inactivity and redirected to the login page.	-	-

Test Case ID	TC-03-003
Related Feature ID	F003
Objective	**Logout -** verify logout functionality while logged in multiple devices with the same credentials

Input	Expected Result	Special Procedural Requirements	Intercase Dependency
User logs out from one device while remaining logged in on another device	User is successfully logged out from that device and redirected to the login page while the other devices remain logged in.	-	-

Test Case ID	TC-03-004
Related Feature ID	F003
Objective	**Logout -** verify behavior when attempting to access restricted pages after logout

Input	Expected Result	Special Procedural Requirements	Intercase Dependency
User tries to access a restricted page after logging out.	System redirects the user to the login page instead of allowing access to the restricted page..	-	-

Test Case ID	TC-03-005		
Related Feature ID	F003		
Objective	**Logout -** ensure session data is cleared upon logout.		
Input	Expected Result	Special Procedural Requirements	Intercase Dependency
User logs out of the system	All session-related data is cleared from the system.	-	-

Test Case ID	TC-03-006		
Related Feature ID	F003		
Objective	**Logout -** ensure logout functionality is accessible and functional across different browsers and devices		
Input	Expected Result	Special Procedural Requirements	Intercase Dependency
Users log out from the system using various browsers (e.g., Chrome, Firefox, Safari) and devices (e.g., desktop, mobile).	User is successfully logged out from that device and redirected to the login page	-	-

F004 - Forgot Password

Test Case ID	TC-04-001		
Related Feature ID	F004		
Objective	**Forgot Password -** validate password reset request submission		
Input	**Expected Result**	**Special Procedural Requirements**	**Intercase Dependency**
User submits a request to reset their password by providing their registered email address.	Confirmation message is displayed indicating that the password reset email has been sent to the user's email address.	-	-
User submits a request to reset their password by providing their unregistered email address	System displays an error message indicating that the email address is not registered and prompts the user to provide a registered email address.	-	-
User submits a password reset request with an invalid email address format.	System displays an error message indicating that the email address format is invalid and prompts the user to provide a valid email address.	-	-

Test Case ID	TC-04-002		
Related Feature ID	F004		
Objective	**Forgot Password -** validate expiration of password reset link after a certain period.		
Input	Expected Result	Special Procedural Requirements	Intercase Dependency
User receives a password reset link via email and clicks on it after 2 minutes..	User is redirected to a page indicating that the password reset link has expired, prompting them to initiate a new password reset request.	-	-

Test Case ID	TC-04-003		
Related Feature ID	F004		
Objective	**Forgot Password -** validate security measures against unauthorized password reset requests.		
Input	Expected Result	Special Procedural Requirements	Intercase Dependency
Multiple password reset requests are submitted for the same email address within a short period.	System detects and blocks subsequent password reset requests for a certain duration	-	-

F005 - Manage Exam

Test Case ID	TC-05-001		
Related Feature ID	F005		
Objective	To verify that the system allows users to create a new exam record.		
Input	**Expected Result**	**Special Procedural Requirements**	**Intercase Dependency**
User clicks on the "Create" button.	The system redirects to a new page for entering exam details, including exam title, description, course code, session, and default grade set according to the predefined grading system.	-	-

Test Case ID	TC-05-002		
Related Feature ID	F005		
Objective	To verify that the system allows users to edit existing exam records.		
Input	**Expected Result**	**Special Procedural Requirements**	**Intercase Dependency**
User selects an exam record and clicks on the "Edit" button.	The system allows the user to modify exam details, such as title, description, course code, session, and grade.	-	-

Test Case ID	TC-05-003
Related Feature ID	F005
Objective	To verify that the system allows users to delete existing exam records.

Input	Expected Result	Special Procedural Requirements	Intercase Dependency
User selects an exam record and clicks on the "Delete" button	The system prompts the user for confirmation to delete the exam record.	-	-

F006 - View Exam

Test Case ID	TC-06-001		
Related Feature ID	F006		
Objective	To verify that the system displays available exam records on the Home page.		
Input	**Expected Result**	**Special Procedural Requirements**	**Intercase Dependency**
User logs in and navigates to the Home page.	The system lists all available exam records.	-	-

Test Case ID	TC-06-002		
Related Feature ID	F006		
Objective	To verify that the system allows users to view details of a specific exam record.		
Input	**Expected Result**	**Special Procedural Requirements**	**Intercase Dependency**
User clicks on a particular exam record from the list.	The system redirects the user to the Exam Details page, displaying exam title, description, and a list of student details (if available).	-	-

F007 - Upload Sample Answer

Test Case ID	TC-07-001		
Related Feature ID	F007		
Objective	**Upload Sample Answer -** User uploads sample answers for each question in text format.		
Input	**Expected Result**	**Special Procedural Requirements**	**Intercase Dependency**
User accesses the Exam Details Page. Sample Answer for each question in text format is uploaded.	System performs validation of text format and confirms upload status with "Upload Success!" success message.	-	-

Test Case ID	TC-07-002		
Related Feature ID	F007		
Objective	**Upload Sample Answer -** User uploads sample answers for each question in an invalid format.		
Input	**Expected Result**	**Special Procedural Requirements**	**Intercase Dependency**
User accesses the Exam Details Page. Sample Answer for each question with invalid format is uploaded.	System performs validation of invalid format and updates upload status with "Upload Fail, Invalid Format" error message.	-	-

Test Case ID	TC-07-003
Related Feature ID	F007
Objective	**Upload Sample Answer -** User uploads empty sample answers for each question.

Input	Expected Result	Special Procedural Requirements	Intercase Dependency
User accesses the Exam Details Page. Empty sample answer is uploaded.	System updates upload status and displays "Upload Fail, No Sample Answer Found!" error message.	-	-

Test Case ID	TC-07-004
Related Feature ID	F007
Objective	**Upload Sample Answer -** Success message is displayed upon success in uploading a sample answer.

Input	Expected Result	Special Procedural Requirements	Intercase Dependency
User accesses the Exam Details Page. Sample Answer for each question in text format is uploaded.	System displays "Upload Success!" message confirming the upload of the sample answer.	-	-

Test Case ID	TC-07-005
Related Feature ID	F007
Objective	**Upload Sample Answer -** Error message is displayed upon failure in uploading a sample answer.

Input	Expected Result	Special Procedural Requirements	Intercase Dependency
User accesses the Exam Details Page. Sample Answer for each question with invalid format is uploaded.	System displays "Upload Fail, Cause X" an error message with the cause of failure in uploading the sample answer.	-	-

F008 - Upload Student Data

Test Case ID	TC-08-001		
Related Feature ID	F008		
Objective	**Upload Student Data -** User uploads student data including student name and answer sheet in the correct data format.		
Input	**Expected Result**	**Special Procedural Requirements**	**Intercase Dependency**
User creates an exam record. User accesses the Exam Details Page. User uploads student data in the correct data format.	System performs validation of data format and updates upload status with "Upload Success!" success message.	-	-

Test Case ID	TC-08-002
Related Feature ID	F008
Objective	**Upload Student Data -** User uploads student data including student name and answer sheet in an invalid data format.

Input	Expected Result	Special Procedural Requirements	Intercase Dependency
User creates an exam record. User accesses the Exam Details Page. User uploads student data in an invalid data format.	System performs validation of data format and updates upload status with "Upload Fail, Invalid Format!" error message.	-	-

Test Case ID	TC-08-003		
Related Feature ID	F008		
Objective	**Upload Student Data -** User uploads empty entry of student data.		
Input	**Expected Result**	**Special Procedural Requirements**	**Intercase Dependency**
User creates an exam record. User accesses the Exam Details Page. User uploads an empty entry of student data.	System updates upload status and displays "Upload Fail, No Student Data Found!" error message.	-	-

Test Case ID	TC-08-004		
Related Feature ID	F008		
Objective	**Upload Student Data -** Success message is displayed upon success in uploading a student data.		
Input	**Expected Result**	**Special Procedural Requirements**	**Intercase Dependency**
User uploads student data in the correct data format.	System displays "Upload Success!" message confirming the upload of the student data.	-	-

Test Case ID	TC-08-005
Related Feature ID	F008
Objective	**Upload Student Data -** Error message is displayed upon failure in uploading a student data.

Input	Expected Result	Special Procedural Requirements	Intercase Dependency
User creates an exam record. User accesses the Exam Details Page. User uploads student data in an invalid data format.	System displays "Upload Fail, Cause X" an error message with the cause of failure in uploading the student data.	-	-

F009 - View Student Score

Test Case ID	TC-09-001		
Related Feature ID	F009		
Objective	**View Student Score** - Check if the system displays the list of student scores correctly		
Input	**Expected Result**	**Special Procedural Requirements**	**Intercase Dependency**
Navigate to the Exam Details page	The list of student scores is displayed without errors	-	-

Test Case ID	TC-09-002		
Related Feature ID	F009		
Objective	**View Student Score** - Test if clicking the eye icon redirects to the Student Answer Page		
Input	**Expected Result**	**Special Procedural Requirements**	**Intercase Dependency**
Click on the eye icon for a student in the Exam Details page	The system redirects to the Student Answer Page. The extracted answer is displayed in text format. The original image of the question paper is displayed.	-	-

Test Case ID	TC-09-003
Related Feature ID	F009
Objective	**View Student Score** - Test if clicking the pencil icon prompts a pop-up with existing student data

Input	Expected Result	Special Procedural Requirements	Intercase Dependency
Click on the pencil icon for a student in the Exam Details page	A pop-up is displayed with the existing data of the student, including name, student ID, and uploaded answer sheet	-	-

Test Case ID	TC-09-004
Related Feature ID	F009
Objective	**View Student Score** - Test if clicking the trash icon prompts a confirmation message and removes the student from the class lis

Input	Expected Result	Special Procedural Requirements	Intercase Dependency
Click on the trash icon for a student in the Exam Details page Click on the "Confirm" button in the confirmation message	A confirmation message is prompted. Upon clicking "Confirm", the student is removed from the class list.	-	-

Test Case ID	TC-09-005
Related Feature ID	F009
Objective	**View Student Score** - Test if the system handles errors gracefully

Input	Expected Result	Special Procedural Requirements	Intercase Dependency
Perform actions such as clicking icons or navigating between pages with incorrect or invalid data	The system displays appropriate error messages for invalid actions or data. The system handles errors gracefully without crashing.	-	-

F010 - Generate Student Report

Test Case ID	TC-10-001
Related Feature ID	F010
Objective	**Generate Student Report** - Test if clicking the "View Result" button redirects the user to the Results page

Input	Expected Result	Special Procedural Requirements	Intercase Dependency
Click on the "View Result" button at the exam record page	The system redirects to the Results page The details of the exam are displayed, including mean and median scores The individual score of each student is displayed.	-	-

Test Case ID	TC-10-002
Related Feature ID	F010
Objective	**Generate Student Report** - Ensure that the system correctly calculates the mean and median scores

Input	Expected Result	Special Procedural Requirements	Intercase Dependency
Upload student answers for an exam with known scores	The mean score displayed on the Results page matches the calculated mean of the uploaded scores The median score displayed on the Results page matches the calculated median of the uploaded scores	-	-

Test Case ID	TC-10-003
Related Feature ID	F010
Objective	**Generate Student Report** - Confirm that the system accurately displays the individual scores of each student

Input	Expected Result	Special Procedural Requirements	Intercase Dependency
Upload student answers for an exam	Each student's score is displayed correctly next to their respective names on the Results page	-	-

Test Case ID	TC-10-004
Related Feature ID	F010
Objective	**Generate Student Report** - Test how the system handles cases where no scores have been uploaded for an exam

Input	Expected Result	Special Procedural Requirements	Intercase Dependency
Navigate to the Results page for an exam without any uploaded scores	The system displays a message indicating that no scores have been uploaded for the exam	-	-

Test Case ID	TC-10-005
Related Feature ID	F010
Objective	**Generate Student Report** - Test the system's response to unexpected or erroneous inputs

Input	Expected Result	Special Procedural Requirements	Intercase Dependency
Perform actions such as clicking buttons or entering data incorrectly	The system displays appropriate error messages for invalid actions or data The system handles errors gracefully without crashing	-	-

F011 - Preprocess Image

Test Case ID	TC-11-001
Related Feature ID	F011
Objective	**Adjust resolution and format -** System preprocesses uploaded images successfully.

Input	Expected Result	Special Procedural Requirements	Intercase Dependency
Uploaded image with correct image format.	The system should adjust resolution and format to optimize for text extraction.	-	-

Test Case ID	TC-11-002
Related Feature ID	F011
Objective	**Display error message -** System displays an error message if image preprocessing fails.

Input	Expected Result	Special Procedural Requirements	Intercase Dependency
Uploaded image with incorrect format.	The system should display an error message: "Image Preprocessing failed. Please try again".	-	-

F012 - Extract Answer

Test Case ID	TC-12-001
Related Feature ID	F012
Objective	**Extract text -** System performs OCR to extract answers from uploaded images.

Input	Expected Result	Special Procedural Requirements	Intercase Dependency
Uploaded image with correct image format with answers.	The system should extract text representing answers from the image.	-	-

Test Case ID	TC-12-002
Related Feature ID	F012
Objective	**Display error message -** System displays an error message if no answers are detected.

Input	Expected Result	Special Procedural Requirements	Intercase Dependency
Uploaded image with correct image format without answers.	The system should display an error message: "Extracting failed".	-	-

Test Case ID	TC-12-003
Related Feature ID	F012
Objective	**Display extracted answer -** System displays extracted answers for user confirmation or redo extraction.

Input	Expected Result	Special Procedural Requirements	Intercase Dependency
Uploaded image with correct image format with answers.	The system should display extracted answers for confirmation or redo extraction.	-	-

F013 - Compare Answer to Question

Test Case ID	TC-13-001		
Related Feature ID	F013		
Objective	Verify that the system correctly identifies a correct student answer when compared to the sample answer.		
Input	Expected Result	Special Procedural Requirements	Intercase Dependency
Sample answer: ["1. A", "2. B"] Student answer: ["1. A", "2. B"]	The system should indicate that the student's answer is correct.	-	-

Test Case ID	TC-13-002		
Related Feature ID	F013		
Objective	Verify that the system correctly identifies an incorrect student answer when compared to the sample answer.		
Input	Expected Result	Special Procedural Requirements	Intercase Dependency
Sample answer: ["1. A", "2. B"] Student answer: ["1. A","2. A"]	The system should indicate that the student's answer is incorrect.	-	-

Test Case ID	TC-13-003
Related Feature ID	F013
Objective	Verify that the system correctly identifies the sequence of students answer with sample answers

Input	Expected Result	Special Procedural Requirements	Intercase Dependency
Sample answer: ["1. A", "2. B"] Student answer: [2. B","1. A"]	The system should indicate that the student's answer is correct even when the sequential is not correct as long as the numbering of students' answers is the same as the sample answer.	-	-

F014 - Calculate Exam Score

Test Case ID	TC-14-001
Related Feature ID	F014
Objective	Verify that the system correctly calculates the score when all answers match perfectly.

Input	Expected Result	Special Procedural Requirements	Intercase Dependency
Sample answers: ["1. A", "2. B", "3. C", "4. D"] Student answers: ["1. A", "2. B", "3. C", "4. D"]	The system should calculate the score as 100%.	-	-

Test Case ID	TC-14-002
Related Feature ID	F014
Objective	Verify that the system correctly calculates the score when some answers match partially.

Input	Expected Result	Special Procedural Requirements	Intercase Dependency
Sample answers: ["1. A", "2. B", "3. C", "4. D"] Student answers: ["1. A", "2. B", "3. X", "4. D"]	The system should calculate the score based on the percentage of correct answers. For example, if 3 out of 4 answers are correct, the score should be 75%.	-	-

Test Case ID	TC-14-003		
Related Feature ID	F014		
Objective	Verify that the system correctly handles cases where there are missing answers from the student.		
Input	**Expected Result**	**Special Procedural Requirements**	**Intercase Dependency**
Sample answers: ["1. A", "2. B", "3. C", "4. D"] Student answers: ["1. A", "2. B"]	The system should calculate the score based on the provided answers. For example, if 2 out of 4 answers are correct, the score should be 50%.	-	-

Test Case ID	TC-14-004		
Related Feature ID	F014		
Objective	Verify that the system updates the student's score record correctly and displays the updated score on the Exam Details page.		
Input	**Expected Result**	**Special Procedural Requirements**	**Intercase Dependency**
Sample answers: ["1. A", "2. B", "3. C", "4. D"] Student answers: ["1. A", "2. B", "3. C", "4. D"]	After calculation, the system should update the student's score record with the calculated score and display it on the Exam Details page.	-	-

F015 - User Manual

Test Case ID	TC-15-001		
Related Feature ID	F015		
Objective	Verify that the users are able to access the app user manual		
Input	**Expected Result**	**Special Procedural Requirements**	**Intercase Dependency**
Click the user manual button	Display the user manual document	-	-

Test Case ID	TC-15-002		
Related Feature ID	F015		
Objective	Verify that the user interface is responsive for all screen sizes to ensure readability		
Input	**Expected Result**	**Special Procedural Requirements**	**Intercase Dependency**
Open the user manual using 3 devices Laptop, Tablet, Phone	Display the user manual an appropriate font size and layout, ensuring all content is fully visible without overflow	-	-

Test Case ID	TC-15-003		
Related Feature ID	F015		
Objective	Verify that the close user manual navigates correctly.		
Input	**Expected Result**	**Special Procedural Requirements**	**Intercase Dependency**

Click the close button in user manual	Redirect to the previous page	-	-

Approvals

Approved Date	Approved Version	Approver Role	Approver