Online Examination System (OES)

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This is to certify that this project titled ***Online Examination System (OES)*** was found to satisfy the requirement for the award of ***Bachelor of Science in Computer Science*** degree by the ***Department of Computer Science, National Textile University, Faisalabad, Pakistan.***

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Abstract

Online Examination System (OES) is a technology-driven website It is a way to simplify examination activities like defining exam patterns, defining exam timer, objective sections, conducting exams using the computer or mobile devices in a paperless manner. It keeps all the record of the teachers and student and their respected activities.

It is a software solution, which allows a particular institute to arrange, conduct and manage examinations via an online environment. This can be done through the Internet, Intranet and/or Local Area Network environment. To bring the live monitoring feature was the key challenge to accumulate into the system. It allows the student to give their exam in required time span. After desired time span the exams is terminated and the student answers were checked automatically which results in rapid result generation.

Admin panel keep track of all the Departments, students and teacher's records, their activities, subjects, ongoing exams, banned students etc. The admin can also control whether the results are shown to the students or not. In short, this system provides a flexible solution to the problems whenever physical activities likewise during corona pandemic happens.

Acknowledgements

I find no word at any command to express my deepest sense of gratitude to the Almighty **ALLAH**, the most gracious, the most merciful and the most beneficent, who gave me the talent to complete this task successfully. It is our utmost duty to express gratitude and respect to **Holy Prophet (Peace Be upon Him)**, who is an everlasting torch of guidance for humanity. We both are much obliged to our **Parents and Family Members** whose prayers have enabled us to reach at this stage. At this occasion, we can't forget our parents for their love, affection, kindness, and guidance at each moment of my life.

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Chapter No
1

Introduction

1. Introduction

1.1. Project Overview

This project assesses students by conducting online objective tests. The tests would be highly customizable. This project will enable educational institutes to conduct test and have automated checking of answers based on the response by the candidates.

The project allows faculties to create their own tests. It would enable educational institutes to perform tests, quiz and create feedback forms. It asks faculty to create his/her set of questions. Faculty then creates groups and adds related students into the groups. Further the tests are associated with specific groups so that only associated students can appear for the test. The result of the response would be available to the faculty of the question set. Further the result would also be mailed to the student. This project would be helpful for creating practice tests, say for educational institutes and as a feedback form.

1.2. Problem Statement

During the Covid-19 outbreak last year many educational institutes were conducting online classes but there was no mode of conducting online exams thus, had to promote the students instead. Also, it involves the use of traditional ways which was difficult to manage, and a lot of workforces was required to monitor and invigilate the students and the exams which is a time-consuming task. Furthermore, the result declaration was not rapid as we've faced recently during the Intermediate-II results.

1.3. Purpose

- Responses by the candidates will be checked automatically and instantly.
- Online examination will reduce the hectic job of assessing the answers given by the candidates.
- Being an integrated Online Examination System, it will reduce paperwork.
- Can generate various reports instantly when and where required.

1.4. Cost Benefit Analysis

The cost of the examiner and the student who is giving the exam is reduced. The cost of the paper and ink reduces to almost half of the traditional method. The transportation cost of reaching the center for both examiner and students gets eliminated. Students can give their exam on a website which also saves time and money required for printing exams.

1.5. Objectives

Objectives of OES are as follows:

- To facilitate exams controlling & monitoring.
- To keep track of admin and student log.
- To conduct more students' exams at the same time.
- To ease the checking of the exam.
- More secure, less cheating.
- It's convenient.

1.6. Scope

This project would be especially useful for educational institutes where regular evaluation of students' is required. Further it can also be useful for anyone who requires feedback based on objective type responses.

1.7. Enhancement Scope

NOTE:

1) Due to limited resources and time, we've only implemented objective based questions but, in the future, we'll extend its services to subjective based questions.

2) The current system provides only multiple choices but single correct answer selection. Faculty may wish to provide multiple choices multiple selection responses.

3) Security logs though not implemented in this system would be well available through the respective database management system and web server software.

4) Unregistered users cannot answer test, they must belong to some group. This is a drawback incase the faculty wants anyone even anonymous users to answer the test.

1.8. Definitions, Acronyms

The sub-section provides the definitions of all terms, acronyms, and abbreviations used in this document to understand the SRS properly is discussed in the following Table 1.

Table 1: Definitions, Acronyms

Sr. No.	Terms/Acronyms	Description
1.	Student	User mostly a student who will appear for the examination
2.	Faculty	Another user mostly faculty member, lecturer or examiner who posts set of questions, the available options, and correct answers.
3.	Administrator	Super user, adds faculty and manages system.

Chapter No
2

Literature Review

2. Literature Review

There are several research and projects focused on developing better ways to manage exam systems and e-learning system. Some of this research focused on various sections of the system

2.1. System Design

System design and its architecture plays an important role in the flexibility of the system if the systems, user interface is not friendly it requires a lot of human effort for grasping and doing all the work.

Likewise, A system designed by Hou [1] was developed in ASP.net which is C# the disadvantage s of designing a system on C# is that it leads to poor user interface and provide limited development facilities which is not feasible in the near future. Furthermore, it is Poor x-platform GUI. C# is an internal part of the. NET framework so the server running the application must be windows based. C# is less flexible as it mostly depends on the. Net framework.

The web application relies solely on Microsoft developed technologies. It runs on the Microsoft.net framework, uses the ASP.NET web server, C# as the intermediate language, ADO.NET to interact with the relational database and Microsoft SQL server as the relational database. Akinsanmi, Ruth [2]

Another system by, Bobde, Chaudhari [3] lacks in confidentiality of the user and provides poor GUI which leads to difficulty in tackling with the workload and accomplishing tasks successfully The online examination using a large database with bank of questions through it the level of students can be evaluated immediately, and some statistical evaluations can be obtained.

As, Huszti and Petho [4]

The developed software offers the following features:

1. Instructors could add any further questions to maximize the size of the bank of questions.
2. Different Page examinations for each student with randomly selected questions from the bank of questions can be done.
3. Different reports for the instructors, students, classes etc. can be obtained.

4. Several students can take their exams simultaneously without any problem inside and outside their campus. The proposed software has been designed to work based on the client server architecture. Electronic exam is a difficult part of e-learning security

Web-based Examination System is an effective solution for mass education evaluation. Another He [5] presents a web-based educational assessment system by applying Bloom's taxonomy to evaluate student learning outcome teacher instructional practices in real time. The system performance is encouraging with experimentation in science and mathematics courses of two local high school. A model for e-Examination in Nigeria where all applicants are subjected to online entrance examination as a way of curbing the irregularities as proposed by the Joint Admissions Matriculation Board (JAMB), the body saddled with the responsibility of conducting entrance examinations into all the Nigerian universities. This model was designed and evaluated in Covenant University, one of the private universities in Nigeria. Their findings revealed that the system has the potentials to eliminate some of the problems that are associated with the traditional methods of examination such as impersonation and other forms of examination malpractices. Ayo, Akinyemi [6**]**

Based on the development of learning in the only Open University in Nigeria Ipaye [7]discusses the process of establishing e-learning environment. Another paper seeks to solve a part of that problem by designing and developing a web application where tests in multiple choice formats will be taken online and graded immediately

The system conducts the examination and auto-grading for students' exams. The system facilitates conducting exams, collection of answers, auto marking the submissions and production of reports for the test. It supports many kinds of questions. It was used via Internet and is therefore suitable for both local and remote examination. The system could help lecturers, instructors, teachers, and others who are willing to create new exams or edit existing ones as well as students participating in the exams. The system was built using. various open-source technologies AJAX, PHP, HTML and MYSQL database are used in this system. An auto-grading module was generalized to enable different exam and question types. The system was evaluated in the Mansoura university quality assurance center. The test proved the validity of using this kind of web-based systems for evaluates students in the institutions with high rate of students. Rashad, Kandil [8]

A successful journey of online learning and exam system that is community driven and based on open-source platform is Moodle.[9] Moodle is highly flexible open-source learning platform. With comprehensive, customizable, and secure learning management features, it can be used to create a private website for dynamic online courses. The acronym of Moodle is "modular object-oriented dynamic learning environment" is also known as a learning management system, or virtual learning environment. The platform can be used for e-learning projects in University, Corporate training, School, and other sectors.

2.2. Problems with exiting solution

We had studied various Colleges and found existing system was manual entry of up keeping of the details of the student who are registered already. And it is exceedingly difficult for every student to come to the examination center. Online examination system is needed to prepare Registration\application form, question paper for the students and need to print a lot of number manually. For calculating how much students registered and verifying details of every student in a month by hand is exceedingly difficult and time consuming. It's not only requiring lots of time but also wastage of money as it requires quite lot of Manpower to do that.

Another component that considers that is the possibility of mistakes. More time require for creating question paper. Time to check right and wrong answers, Manually Calculating Marks. Human erroneousness. Limitation of Number of students can give papers at a Time. Require Teacher to monitor examination center

The existing system lacks in various aspects which are discussed as follows:

- Poor Graphical User Interface(GUI)
- User Confidentiality
- Transparency
- User Integrity
- No updating facilities of Student, Teacher profile
- Limited Registration seats for students

2.3. Reasons of Development

The reason of development for our project are due to many aspects which are discussed as follows:

- To make user-friendly Graphical User Interface(GUI)
- To provide User Confidentiality
- Providing Transparency to users
- Providing User Integrity
- Providing updating facilities of Student, Teacher profile
- Un-Limited Registration seats for students
- Rapid result generation
- Result report generation
- Manageable Hierarchy
- Profile Setup Facilities

Chapter No
3

Functional
&
Specific Requirements

3. Functional or Specific Requirements

Required software is for conducting on-line `***objective***' type examination and providing immediate results. The system should satisfy the following requirements:

3.1. Methodology

Waterfall-Model

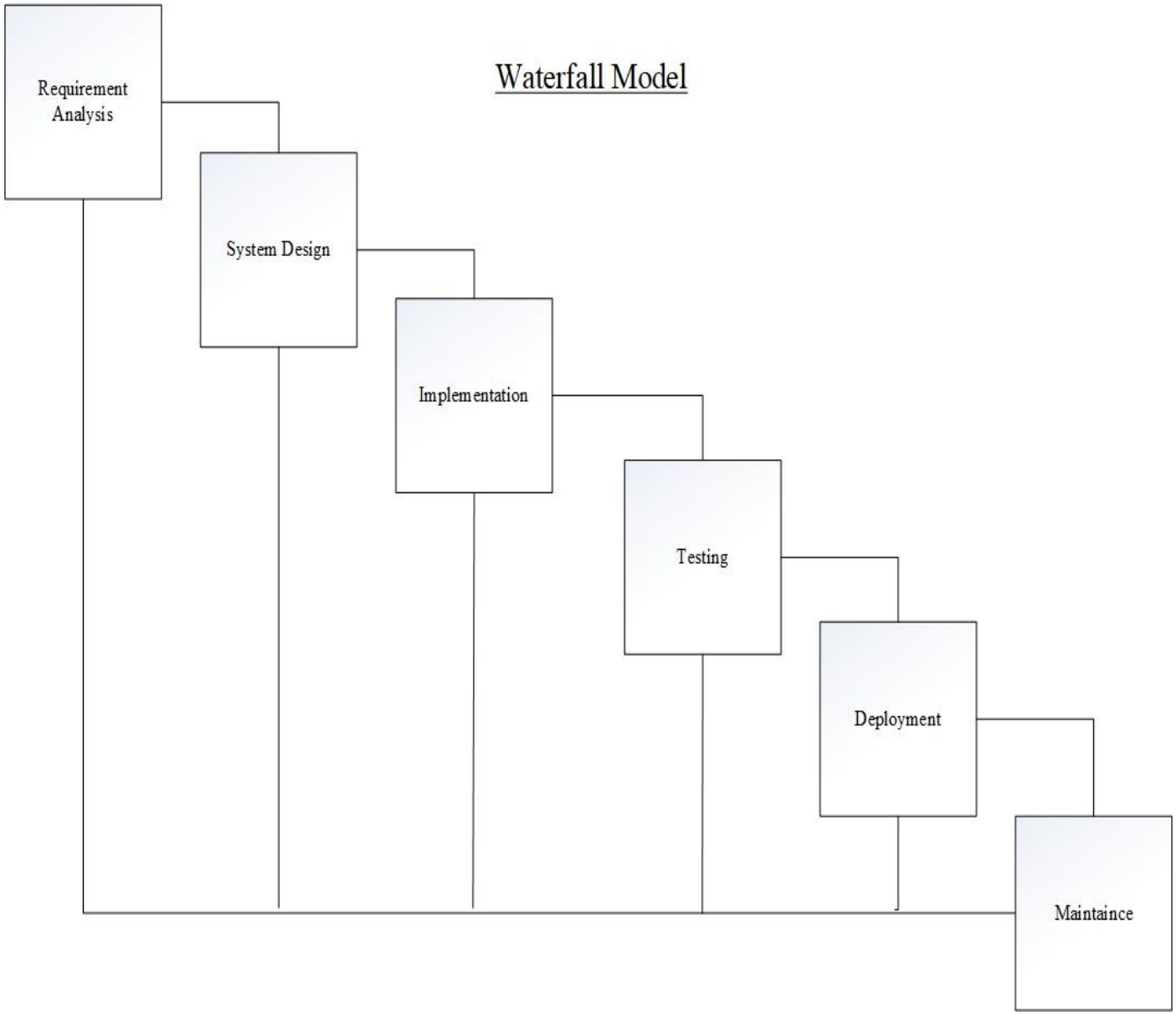

Figure 1: Waterfall Methodology

This Figure 1 illustrates how the Waterfall methodology works in providing the solution of the problem

The Waterfall Model was the first Process Model to be introduced. It is also referred to as a linear-sequential life cycle model. It is amazingly simple to understand and use. In a waterfall model, each phase must be completed before the next phase can begin and there is no overlapping in the phases.

The sequential phases in Waterfall model are as follows:

Requirement Gathering and analysis: All requirements of the system to be developed are captured in this phase and documented in a requirement specification document.

System Design: The requirement specifications from first phase are studied in this phase and the system design is prepared. This system design helps in specifying hardware and system requirements and helps in defining the overall system architecture.

Implementation: With inputs from the system design, the system is first developed in small programs called units, which are integrated in the next phase. Each unit is developed and evaluated for its functionality, which is referred to as Unit Testing.

Integration and Testing: All the units developed in the implementation phase are integrated into a system after testing of each unit. Post integration the entire system is evaluated for any faults and failures.

Deployment of system: Once the functional and non-functional testing is done; the product is deployed in the customer environment or released into the market.

Maintenance: There are some issues which come up in the client environment. To fix those issues, patches are released. Also, to enhance the product some better versions are released. Maintenance is done to deliver these changes in the customer environment.

All these phases are cascaded to each other in which progress is seen as flowing steadily downwards (like a waterfall) through the phases. The next phase is started only after the defined set of goals are achieved for previous phase and it is signed off, so the name "Waterfall Model". In this model, phases do not overlap.

3.2. Aspect

3.2.1. Administrator Aspect

- Taking backup of the database
- Editing/Deleting/Creating the database
- Adding or expelling faculty
- Changing the super password

3.2.2. Faculty Aspects

- Logging into the system.
- Sending invitations to specific student by mail
- Accepting registrations of candidates
- Create/Edit/Delete candidate groups
- Creating a test
- Posting questions in the above test
- Posting multiple options to respective question
- Marking correct answer within the given options
- Specifying to allow user defined answer
- Time limit of the test if any.
- Whether to randomize the questions
- Whether to randomize the options displayed
- To allow the test to be taken in practice mode where the correct answer is shown immediately after the candidate selects an option.
- Set negative marks for wrong responses

3.2.3. Student Aspects

- Requesting registration
- Logging into the system
- Edit user information
- Selecting the test.
- Selecting whether the test to be taken in practice mode where the correct answer is shown immediately after the candidate selects an option.
- Appearing for the examination.
- Printing the result at the end of the examination.
- Reviewing the given responses.
- Changing password.
- Resetting of forgotten password

3.2.4. Analysis

- Authenticating users based on username and password
- Keeping session track of user activity
- Recording candidates' responses to every question
- Checking whether the given response is correct or not
- Keeping history of test reports of all users

3.2.5. Mailing

- The reports are required to be mailed to the candidates on the registered mail address.
- Temporary password will be mailed to the user incase the user forgets the password.
- Invitations for the appearance for the new test will be mailed.

3.3. External Interface Requirements

3.3.1. Hardware Interfaces

Server-side hardware

- Hardware recommended by all the software needed.
- Communication hardware to serve client requests

Client-side hardware

- Hardware recommended by respective client's operating system and web browser
- Communication hardware to communicate the server

3.3.2. Software Interface

Server-side software

- Web server software, Apache Tomcat
- Server-side scripting tools: PHP
- Database tools: Sedna native XML DBMS
- Compatible operating system: Linux

Client-side software

- Web browser supporting JavaScript, refer Browser Compatibility 2.3.1

3.3.3. Third Party Software Interfaces

None

3.3.4. Communication Protocol

Following protocols are required to be permitted on the server side

- HTTP incoming request
- HTTPS incoming request if secure gateway is implemented

Following protocols are required to be permitted on the client side

- HTTP outgoing request
- HTTPS outgoing request if secure gateway is implemented

3.3.5. Assumption and Dependency

- Usernames are valid email addresses of respective user
- Administrator has the authority to add/delete faculty level accounts.
- Faculty have the authority to approve/expel student
- Faculty have the authority to change student's group

3.4. Non-Functional Requirements

- System should be able handle multiple users
- Database updating should follow transaction processing to avoid data inconsistency.

3.5. Software System Attributes

3.5.1. Browser Compatibility

The project being web based required compatibility with at least the popular web browsers. Microsoft Windows XP and above, Linux and Macintosh being the current popular operating system and Microsoft Internet Explorer, Mozilla Firefox, Opera, Safari, and Google Chrome being the currently popular web browsers. The following Table 2 shows the browser compatibility of our program.

Table 2: Browser Compatibility

Operating System → / **Browsers ↓**	***Win 2000***	***Winx***	***WinXPSP2***	***Win Vista***	***Win 7***	***Win 8, 9, 10***	***Mac OS***	***Linux***
		Modern Browsers						
IE 8.0	*N/A*	*SUPP*	*SUPP*	*SUPP*	*SUPP*	*SUPP*	*N/A*	*N/A*
IE 7.0	*N/A*	*N/A*	*N/A*	*N/A*			*N/A*	
IE 6.0	*N/A*	*N/A*	*N/A*	*N/A*			*N/A*	
Firefox 3.5	*N/A*	*SUPP*	*N/A*	*N/A*			*N/A*	
Opera 9.23	*N/A*	*SUPP*	*N/A*	*N/A*			*N/A*	
Safari 9.27	*N/A*	*SUPP*	*N/A*	*N/A*			*SUPP*	
		"Legacy" Old Browsers						
IE5.5	*N/A*	*N/A*	*N/A*	*N/A*			*N/A*	
Netscape	*N/A*	*N/A*	*N/A*	*N/A*			*N/A*	

3.5.2. Security

- Administrator has the highest authority to edit/delete/create database
- Faculty have the authority to add/expel students
- Students can only view their test records.
- Faculty can view all the test records of every student.
- Critical information like passwords should be transferred in encrypted form
- Passwords should be stored in encrypted form
- Password will not be mailed to the user in case user forgets password, instead either temporary password or a password resets link will be sent.

3.5.3. Reliability

Data validation and verification needs to be done at every stage of activity.

- Validating user input
- Use of locking mechanism while updating database like transaction processing
- Recovering the transaction using rollback.

3.5.4. Availability

`The examination system being an online system should be available anytime.

Constraints:

- Though the system should be available 24x7 some features may be restricted.
- Quiz creator may allow the specific test to be available only at certain time like scheduled examination.
- The test may be time limited so the candidates appearing will have limited time to answer the test.

3.5.5. Portability

- The web application will be built using PHP which has support to run on any platform provided the required compilers are available.
- For database either XML or MySQL would be used, that too has extensive support over many popular architectures and operating systems.

Constraints:

Portability would be limited to the support provided by the respective application vendor on various architectures and operating environments.

3.5.6. Performance

The system would be used by multiple users at a time and may grow as time passes; the system would need to implement multithreading to achieve acceptable performance. Further a database connection pool may also be required for assigning faster database connection.

3.6. Database Requirements

Database fields for questions and respective options must be in Unicode format to manage non-English character

3.7. Technologies

This section lists all the technologies for the web-based system.

- PHP scripting for server-side scripting as it has an extraordinarily strong support for XML and MySQL.
- XML as database format: The database' performance requirements are not very high and the ability to have custom fields in case the quiz creator needs to add more than expected answer options. Apache as web server has a tight integration with various platforms.

3.8. Software

- NetBeans or Eclipse for PHP and XML coding.
- Apache Tomcat as Web server

3.9. Test Cases

3.9.1. Black Box Testing

Black box testing is a type of testing technique of the system with no prior knowledge of the system as lay person. A tester provides the input, and

observes the expected output generated by the system. This makes it possible to identify how the system responds to expected and unexpected user actions.

3.9.2. White Box Testing

In contrast with the black box testing, white box testing refers to the scenario where the tester deeply understands the whole functionality of the system and system components are evaluated. Gaining deep understanding of the system need the tester to have knowledge of the program or code-level

3.9.3. Test Cases

Test cases are created to evaluate the overall functionality of the system. These test cases are created for every feature of the system and the expected outputs of the system whether the system is giving proper expected output or not.

3.9.3.1.Test Case: Login

Test Case ID	Test Case Condition	Expected Result	Actual Result	Test Case Result
Login 5.1.1, Login 5.2.1, Login 5.3.1	Fill out the Form	Login Successful	Login Successful	**PASS**

3.9.3.2.Test Case: Add Department

Test Case ID	Test Case Condition	Expected Result	Actual Result	Test Case Result
Department 5.1.4	Fill out the Form	Addition Successful	Addition Successful	**PASS**

3.9.3.3.Test Case: Add Categories

Test Case ID	Test Case Condition	Expected Result	Actual Result	Test Case Result
Categories 5.1.5	Fill out the Form	Addition Successful	Addition Successful	**PASS**

3.9.3.4.Test Case: Add Subjects

Test Case ID	Test Case Condition	Expected Result	Actual Result	Test Case Result
Subjects 5.1.6	Fill out the Form	Addition Successful	Addition Successful	**PASS**

3.9.3.5.Test Case: Add Students

Test Case ID	Test Case Condition	Expected Result	Actual Result	Test Case Result
Students 5.1.7	Add Credentials	Addition Successful	Addition Successful	**PASS**

3.9.3.6.Test Case: Add Faculty

Test Case ID	Test Case Condition	Expected Result	Actual Result	Test Case Result
Faculty 5.1.8	Add Credentials	Addition Successful	Addition Successful	**PASS**

3.9.3.7.Test Case: Add Notice

Test Case ID	Test Case Condition	Expected Result	Actual Result	Test Case Result
Notice 5.1.9	Enter Notice	Addition Successful	Addition Successful	**PASS**

3.9.3.8.Test Case: Give Exam

Test Case ID	Test Case Condition	Expected Result	Actual Result	Test Case Result
Examination 5.2.5	Select Exam	Active-Exam Successful	Active-Exam Successful	**PASS**

3.9.3.9.Test Case: Send Invitation

Test Case ID	Test Case Condition	Expected Result	Actual Result	Test Case Result
Send Invitation 5.3.4	Write Invitation	Send-Invite Successful	Send-Invite Successful	**PASS**

3.9.3.10. Test Case: Make Exam

Test Case ID	Test Case Condition	Expected Result	Actual Result	Test Case Result
Make Exam 5.3.7	Add Fill in the blanks/ MCQS	Exam-Creation Successful	Exam-Creation Successful	**PASS**

3.10. Hardware

The recommended hardware specified by the respective software would suffice the needs. The memory and processing power needed would increase as the number of users increase. The estimated hardware requirements are as specified.

3.10.1. Server

The minimum hardware as recommended by all the software required on server side say web server, operating system, and development software

- Processing speed of 1.6 GHz
- 1 GB of RAM
- Network interface

3.10.2. Client

The minimum hardware as recommended by all the software required on client side say web browser, operating system

- Minimum hardware depending on the operating system used
- True color visual display unit
- User peripherals for better interaction

Chapter No
4

Analysis
&
Design Pattern

4. Analysis and Design

4.1. Use Case Diagram

4.1.1. Use case Overview

The Figure 2 illustrates how the overall system collaborate with each other for its functioning.

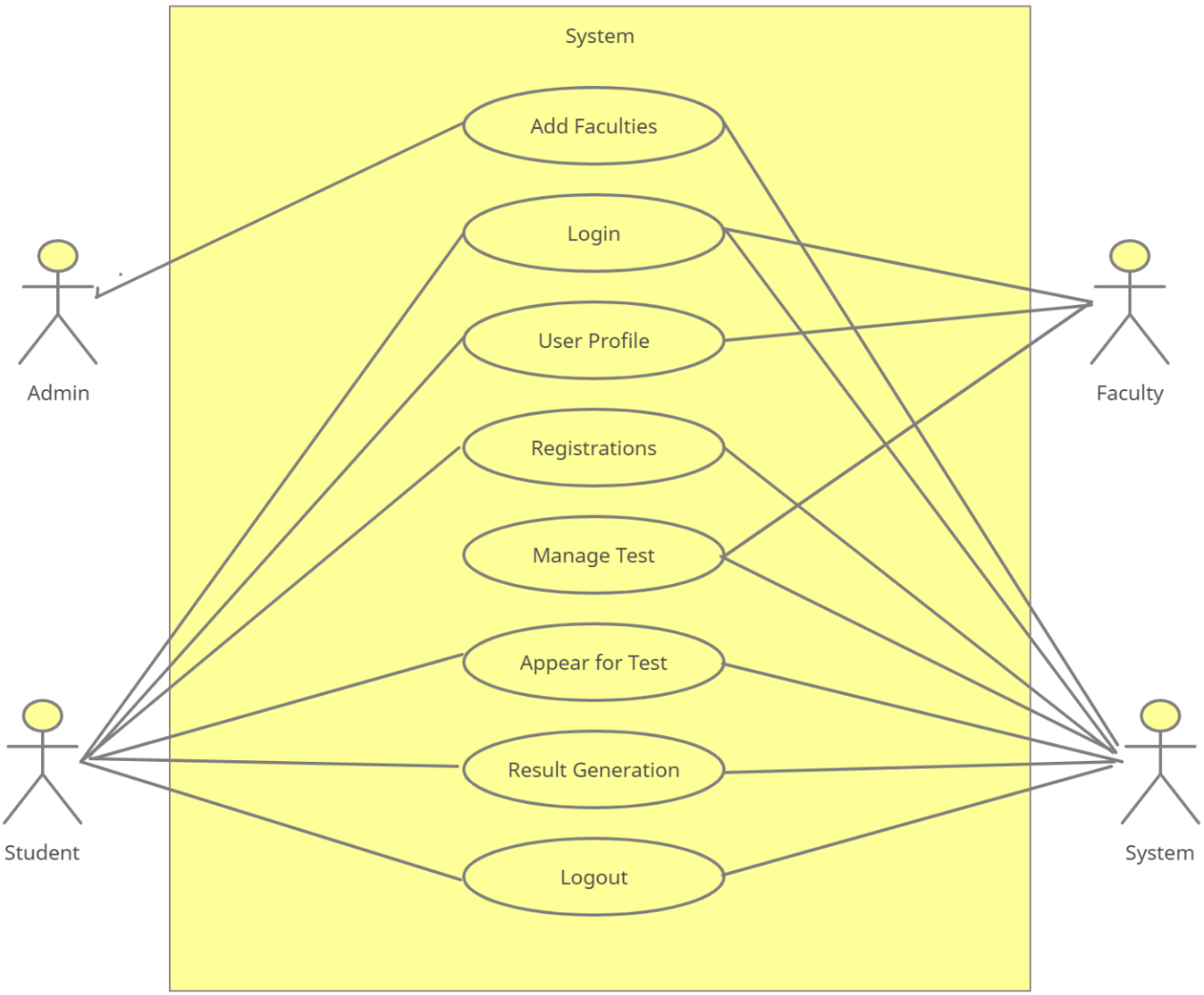

Figure 2: Use Case-Overview

4.1.2. Add Faculty Use Case

The Figure 3 illustrates Faculty login names can be added by the administrator, as well as temporary passwords for the user to sign in.

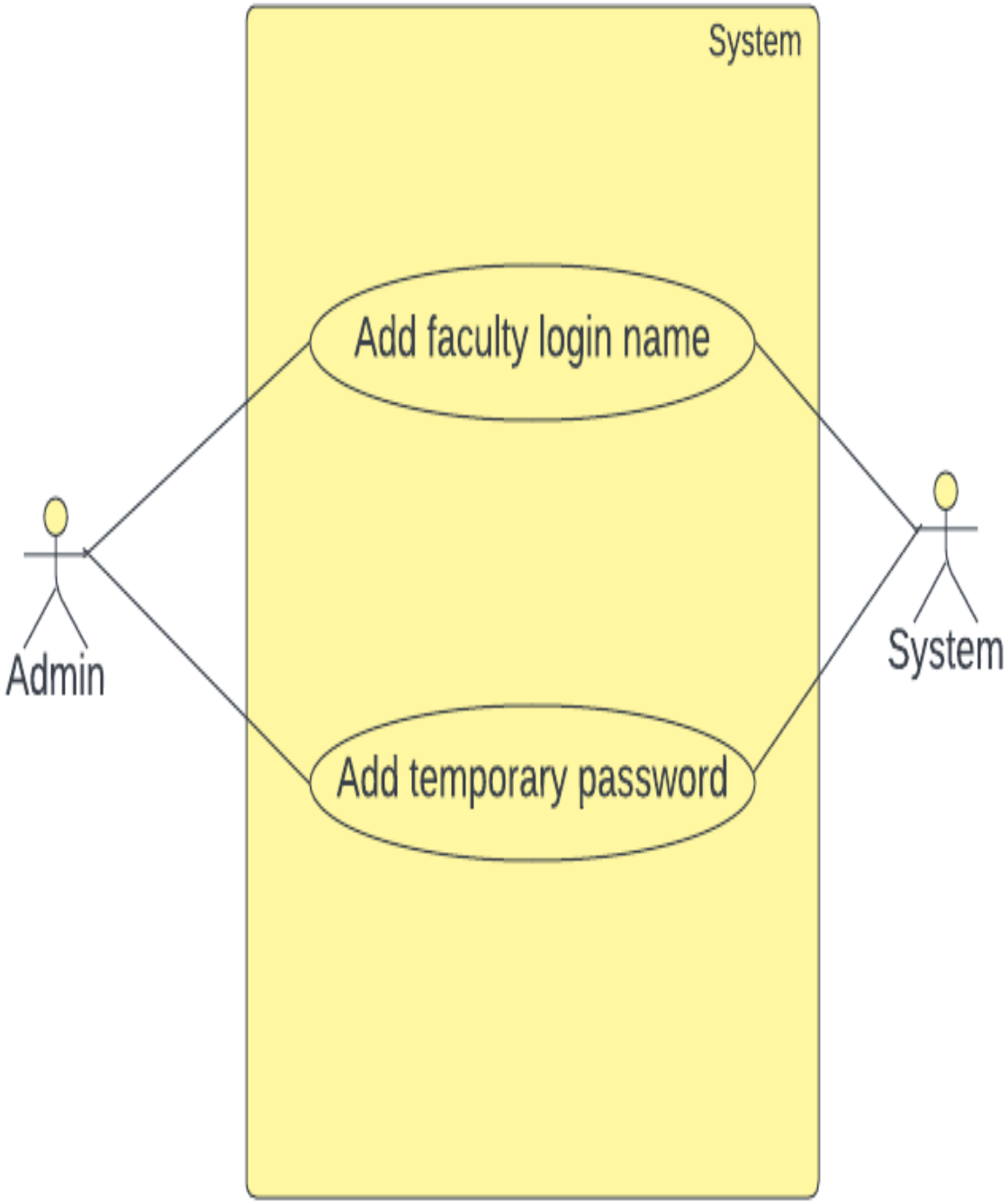

Figure 3: Use Case-Add Faculty

4.1.3. Login Use Case

The Figure 4 illustrates for login, students and faculty enter their username and password. Before logging in, the system verifies the username and password.

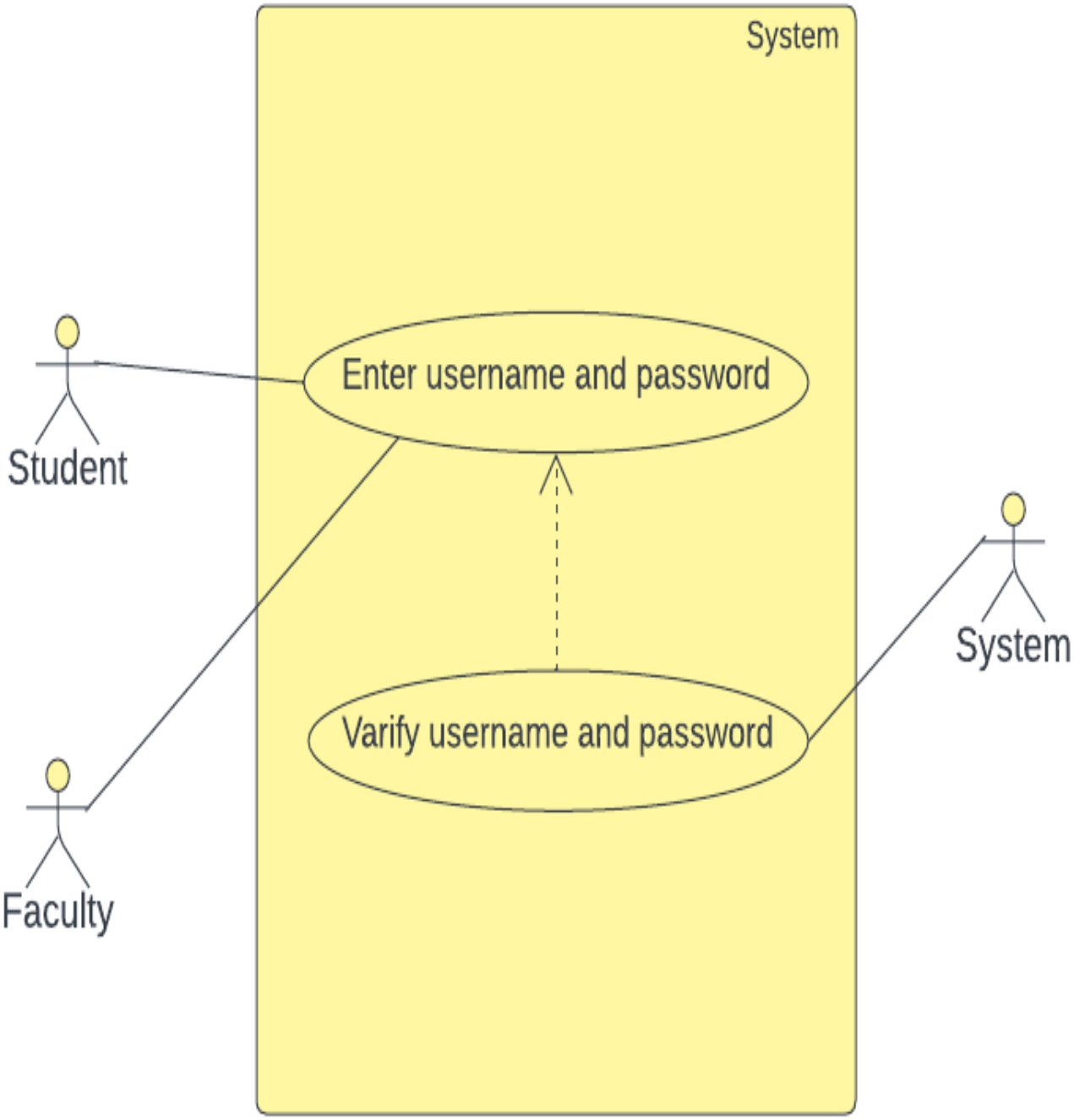

Figure 4: Use Case-Login

4.1.4. Student Registration Use Case

The Figure 5 illustrates Students receive the invitation and then enter the name and password

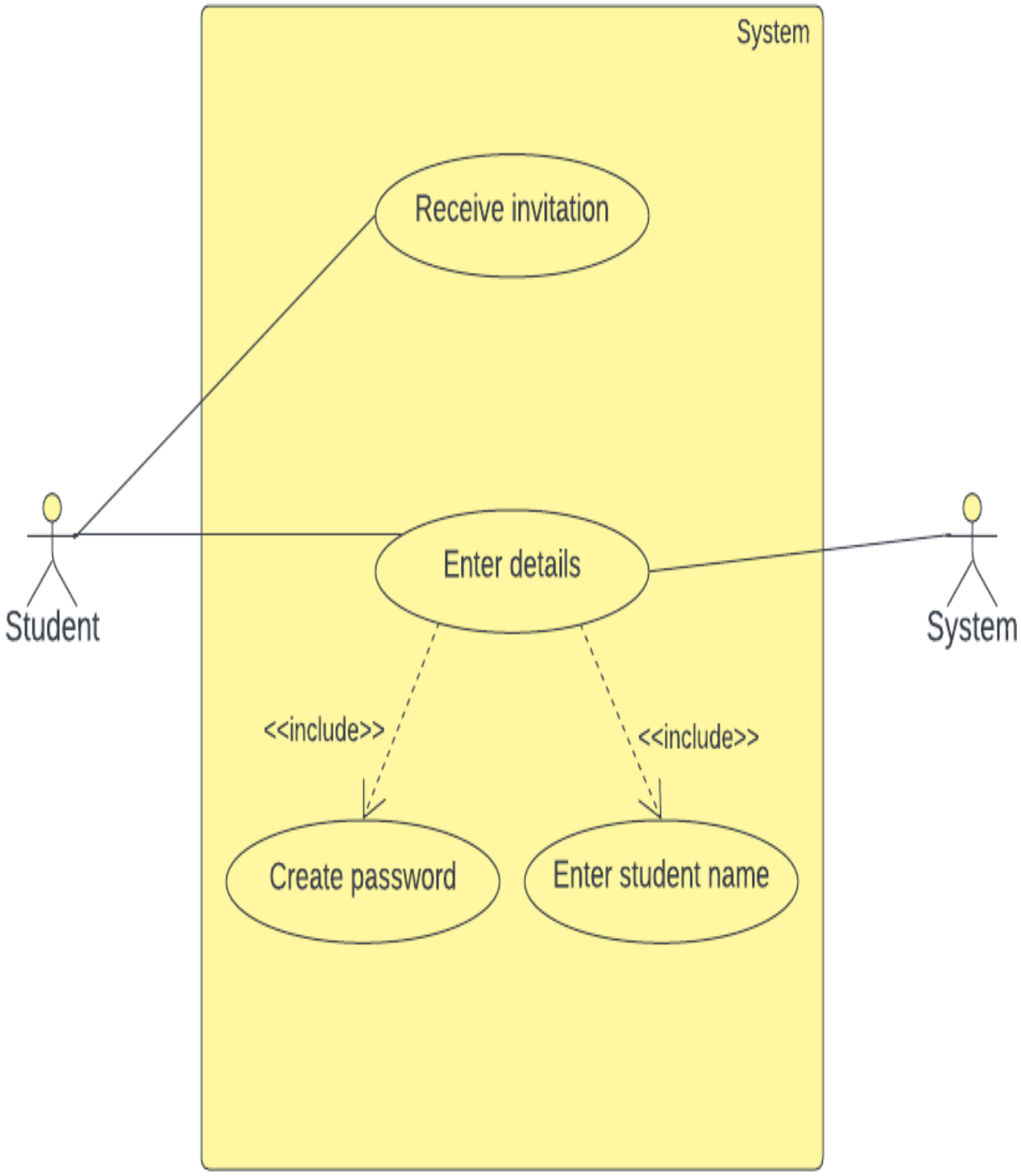

Figure 5: Use Case-Student Registration

4.1.5. User Profile Edit Use Case

The Figure 6 illustrates the admin can update the profile picture and password Students can change their profile pictures and passwords The profile picture and password can be changed by faculty

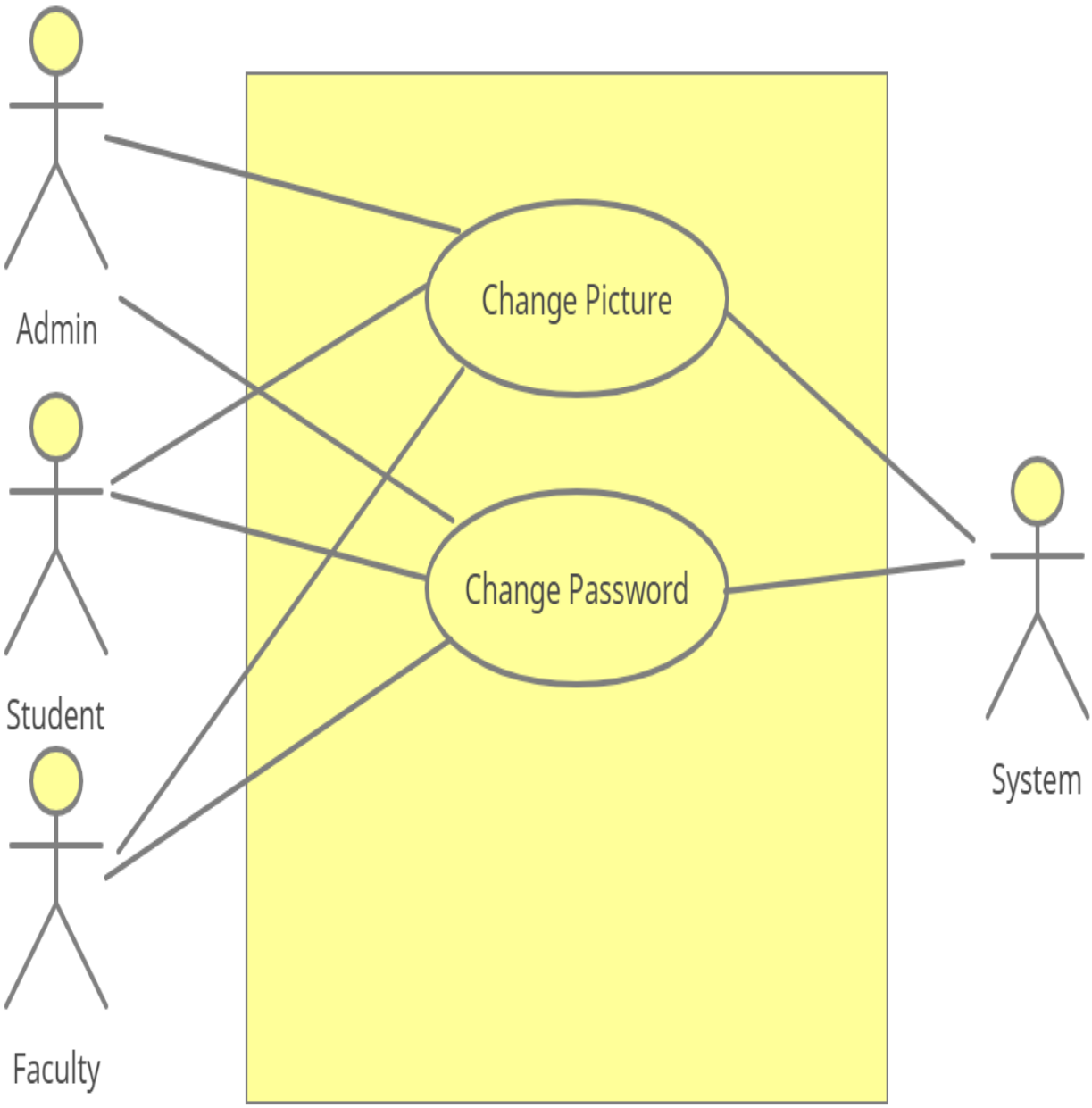

Figure 6: Use Case-Profile Edit

4.1.6. Manage Test Use Case

The Figure 7 illustrates the faculty member can login, set the test title, set the exam time and date, enter the questions, and choose the correct answer out of 4 options. Overall functionality is controlled by the system

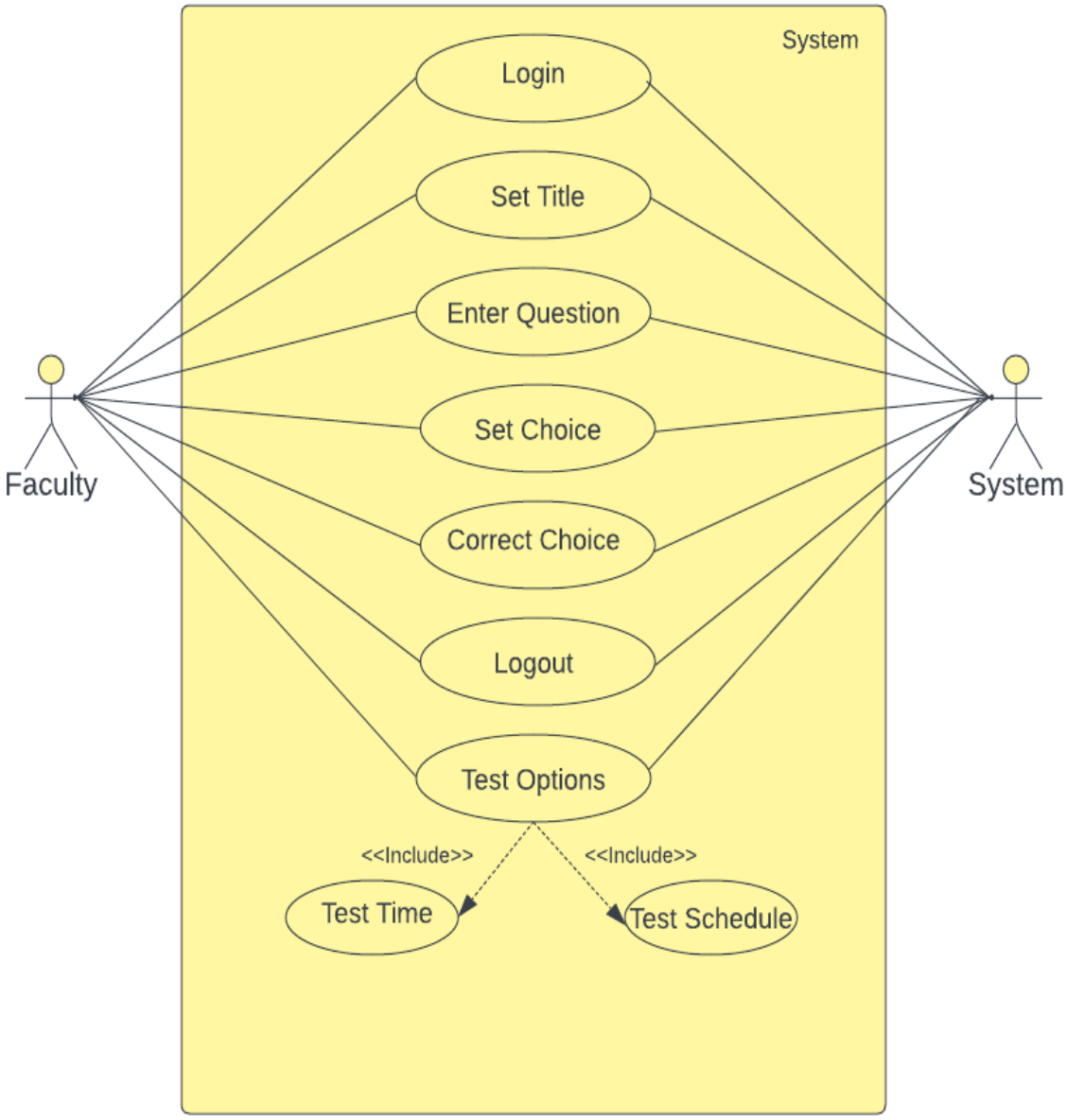

Figure 7: Use Case-Manage Test

4.1.7. Appear for Test Use Case

The Figure 8 illustrates After logging in, the student chooses the test, selects the mode, and answers the questions. The system inspects the exam

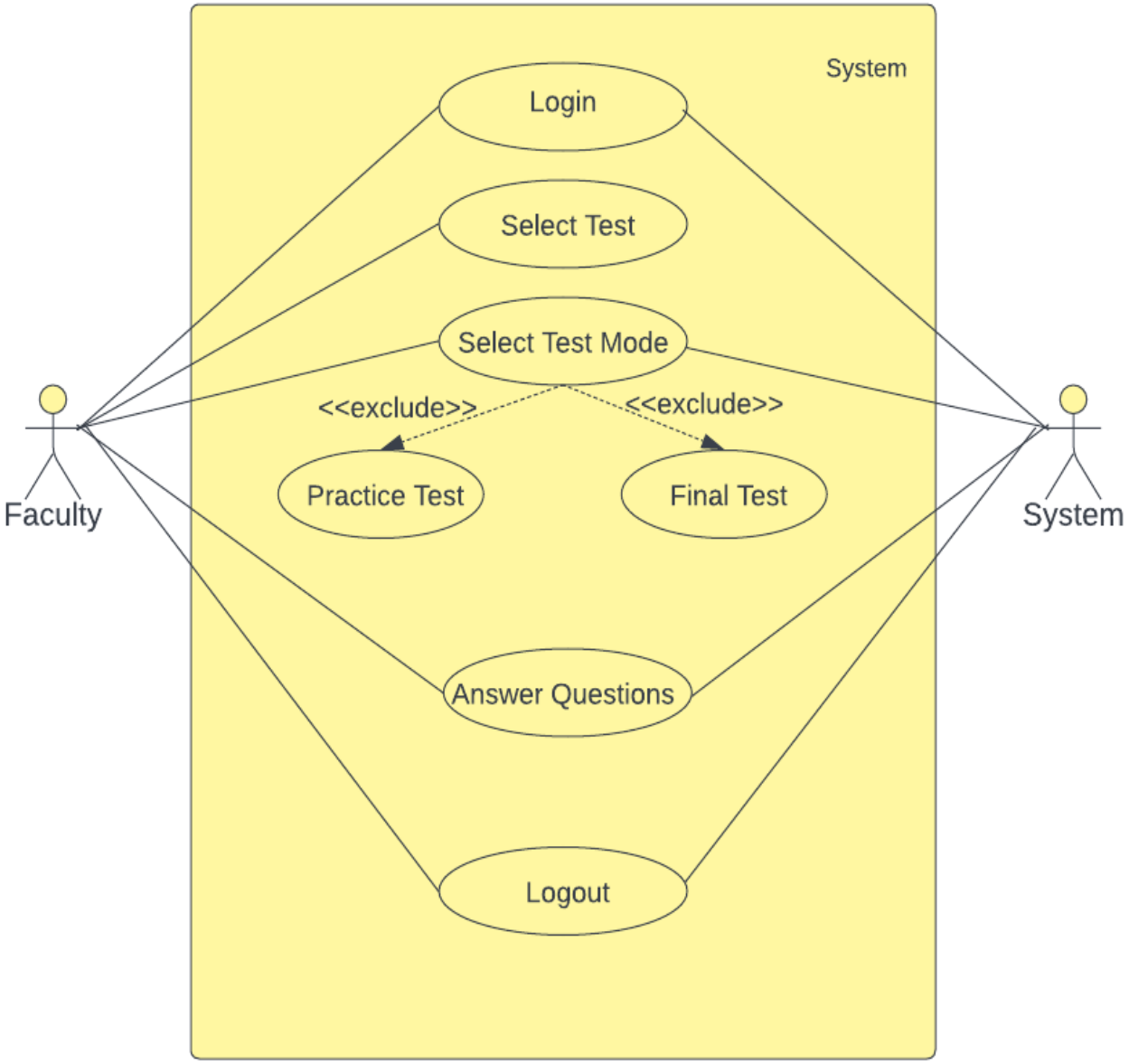

Figure 8: Use Case- Appear for Test

4.1.8. Generate Result Use Case

The Figure 9 illustrates the system checks the answer and calculates the marks. The result is displayed as a percentage.

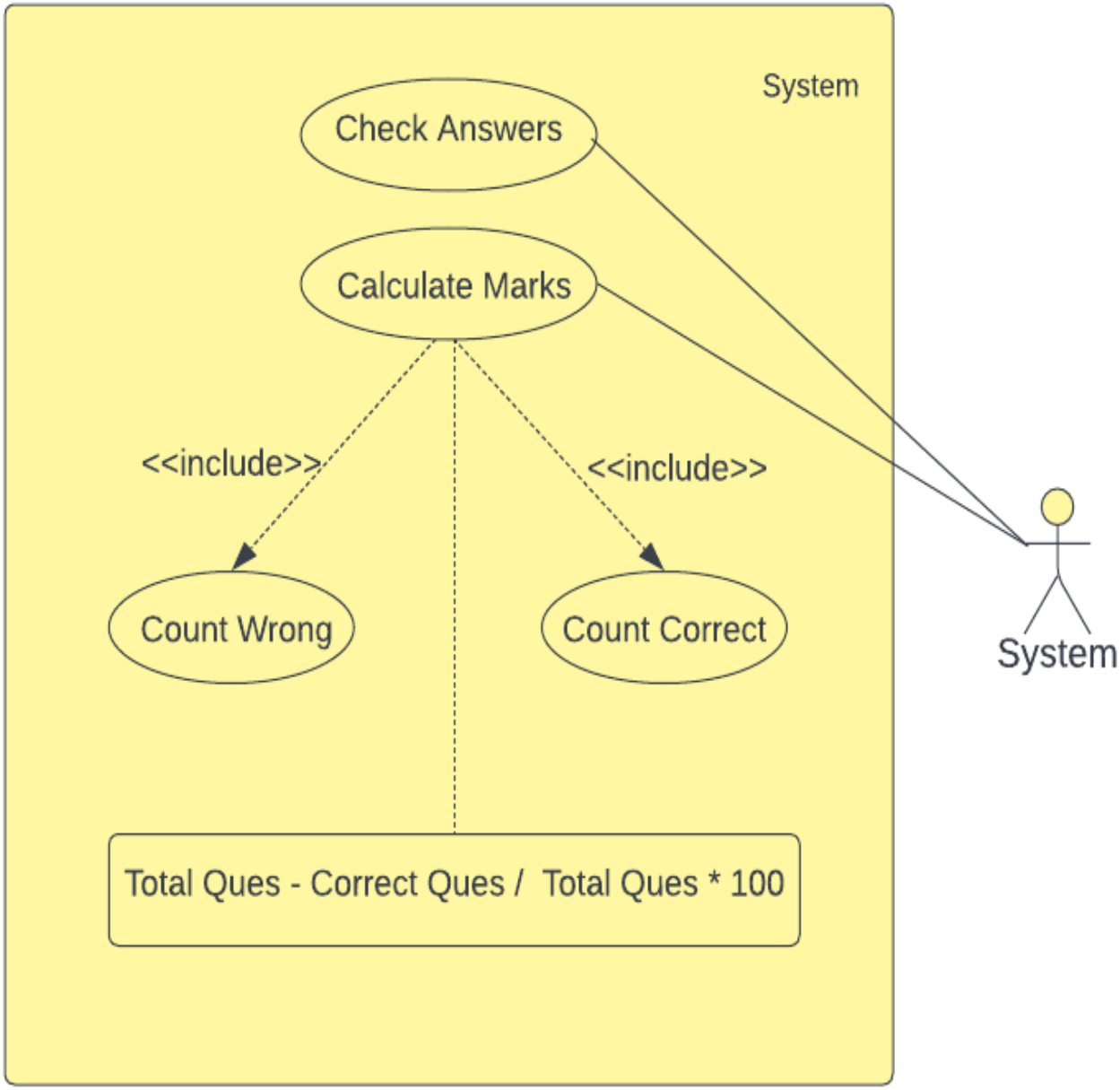

Figure 9: Use Case-Generate Result

4.2. Activity Diagram

4.2.1. Login Activity Diagram

The Figure 10 illustrates the flow of login of a specific user.

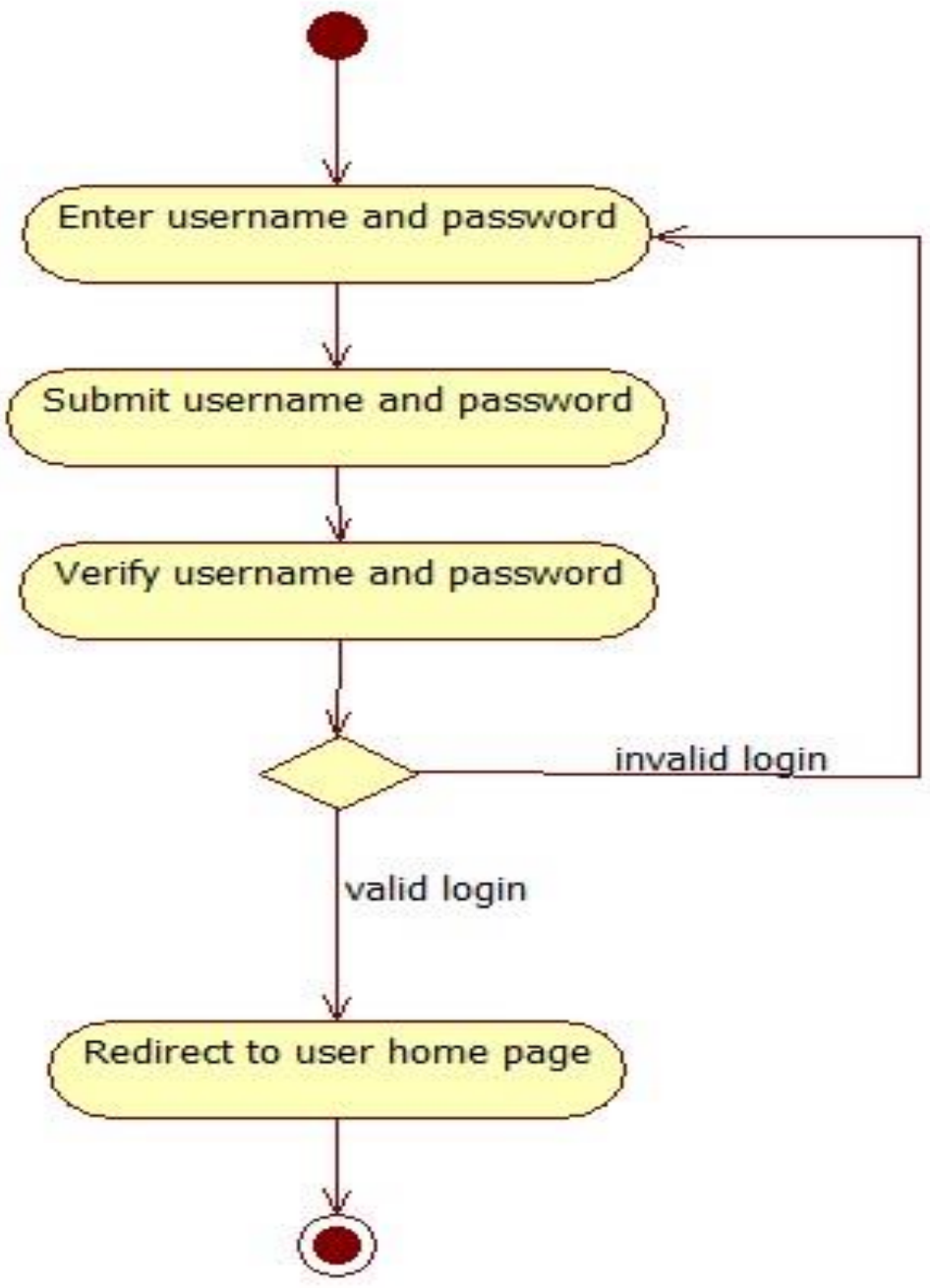

Figure 10: Activity Diagram-Login

4.2.2. Manage Students Activity Diagram

The Figure 11 illustrates how the students are managed and added by their appropriate invite.

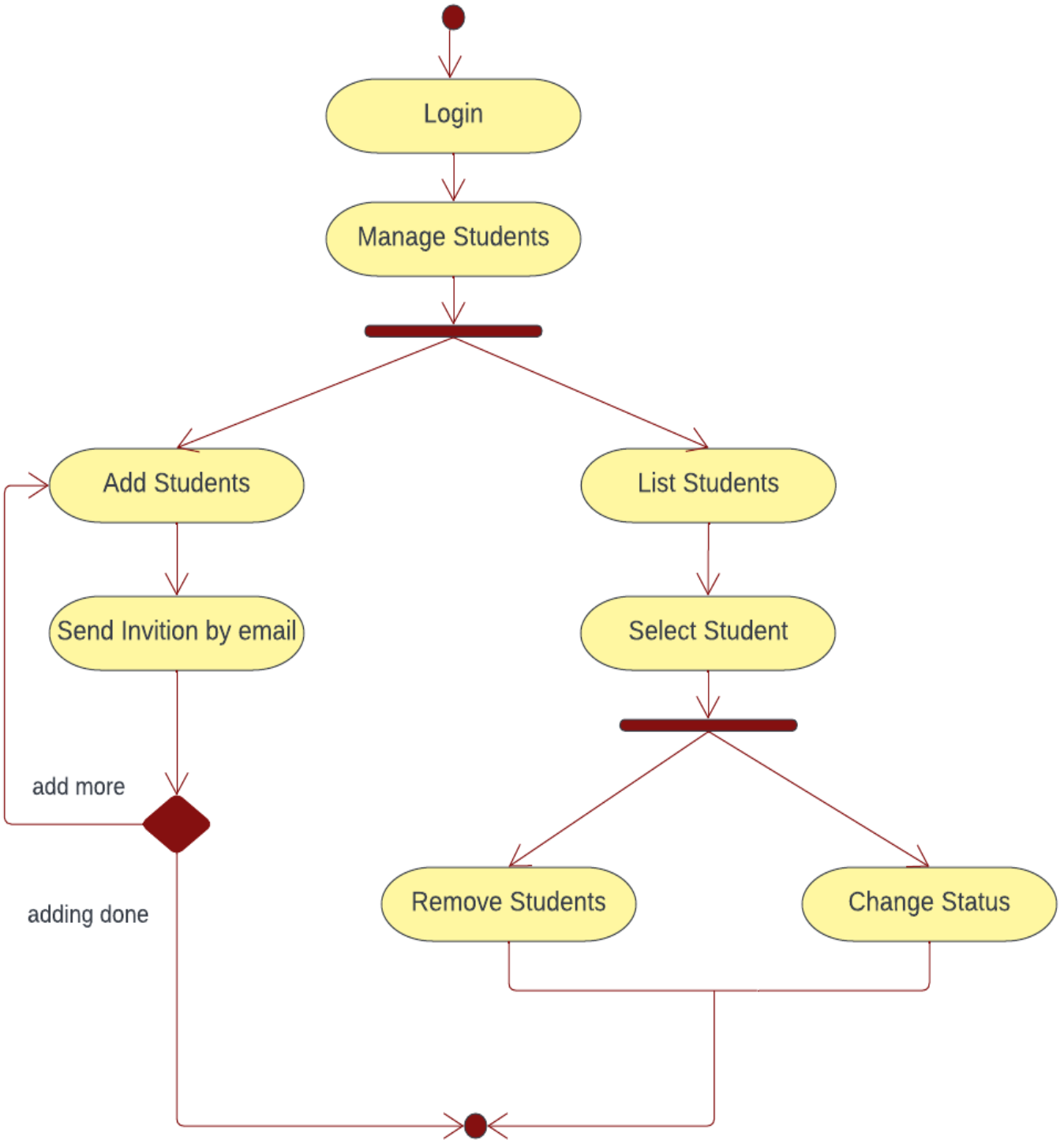

Figure 11: Activity Diagram-Manage Students Activity

4.2.3. Manage Tests Activity Diagram

The Figure 12 illustrates the managing and creation of test after logging in.

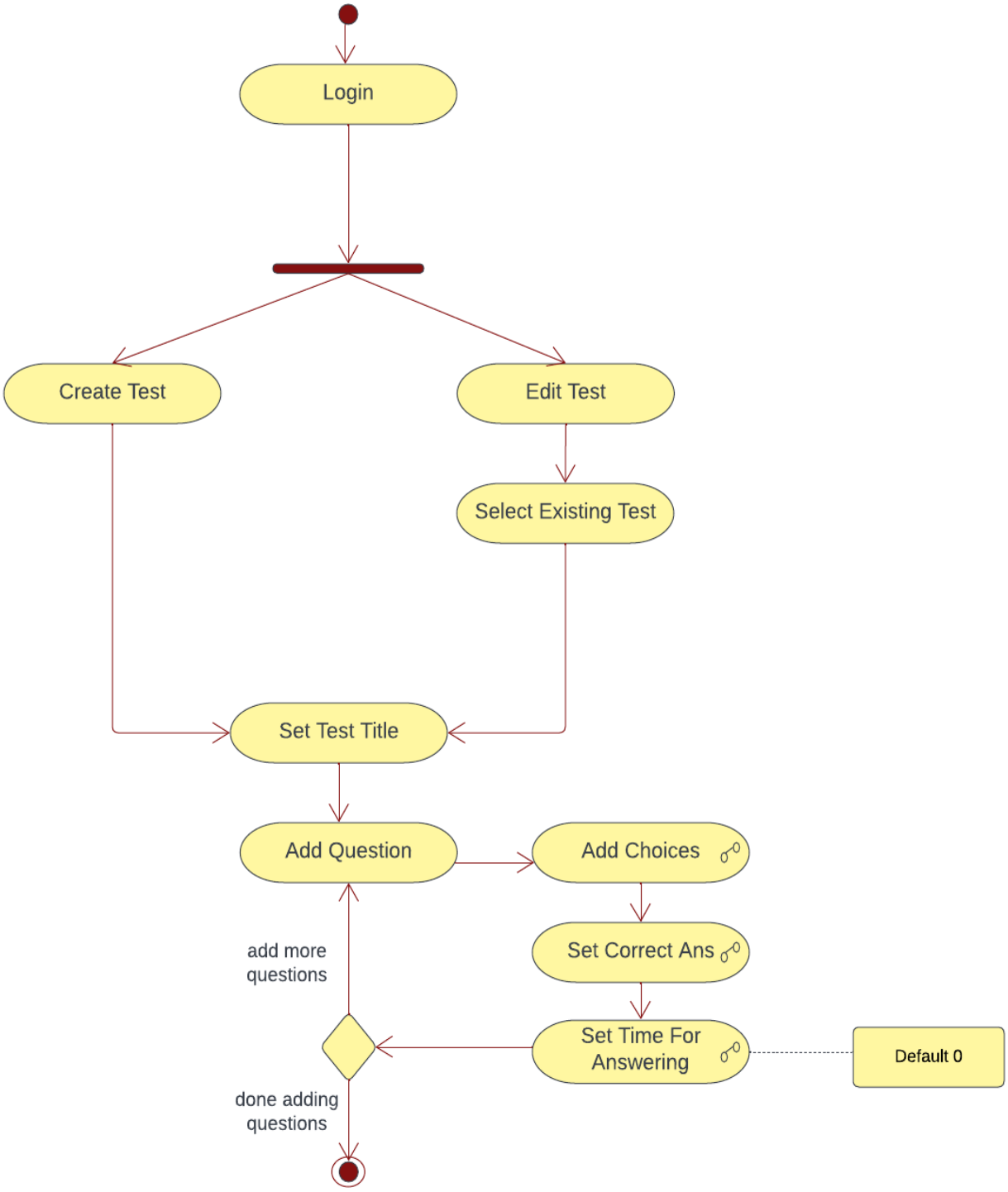

Figure 12: Activity Diagram-Manage Test

4.2.4. Generate Result Activity Diagram

The Figure 13 illustrates the generation of results after the exam is conducted and submitted.

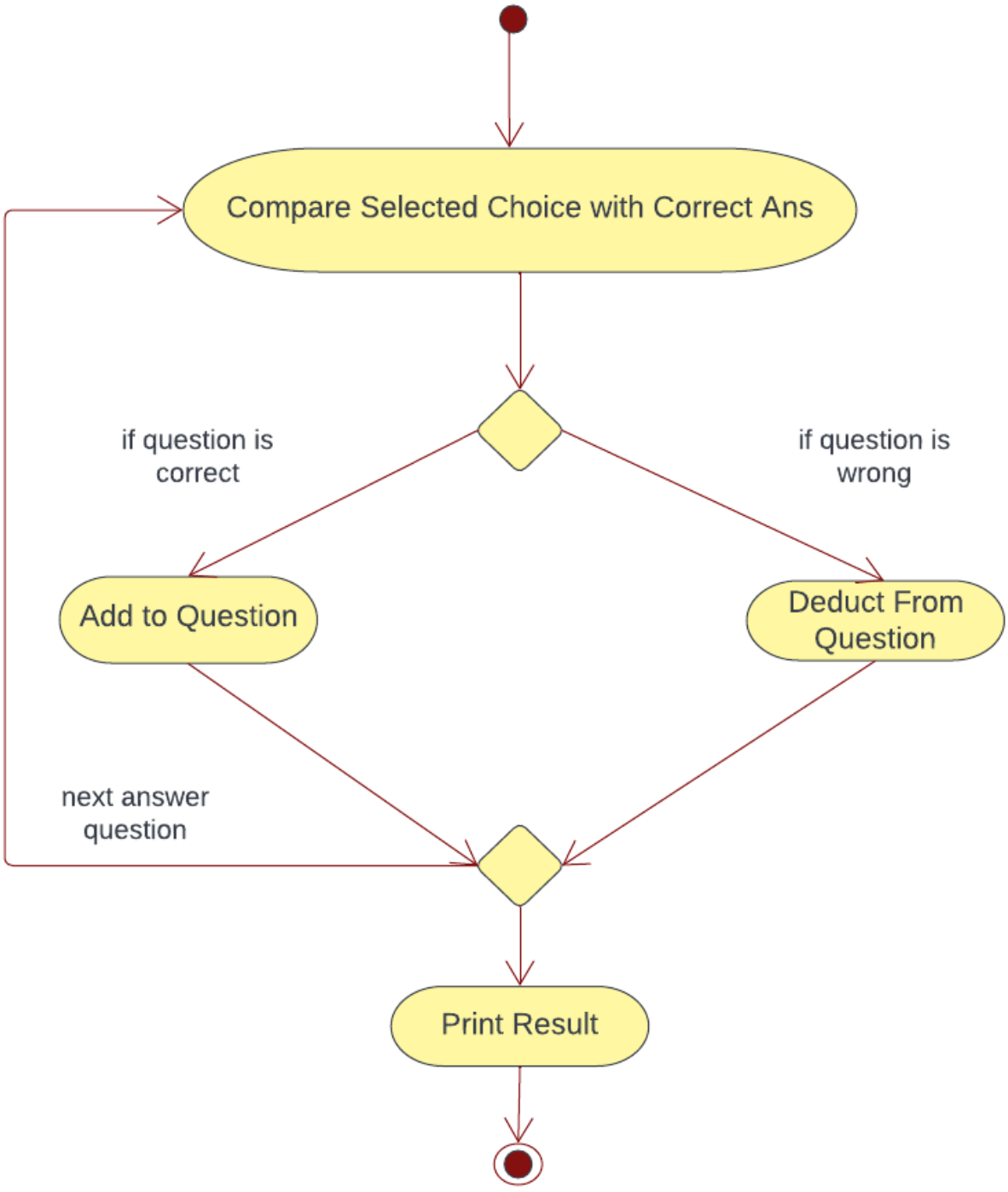

Figure 13: Activity Diagram-Generate Result

4.2.5. Student Registration Activity Diagram

The Figure 14 illustrates how the students on receiving an invitation e-mail gets registered for the exam.

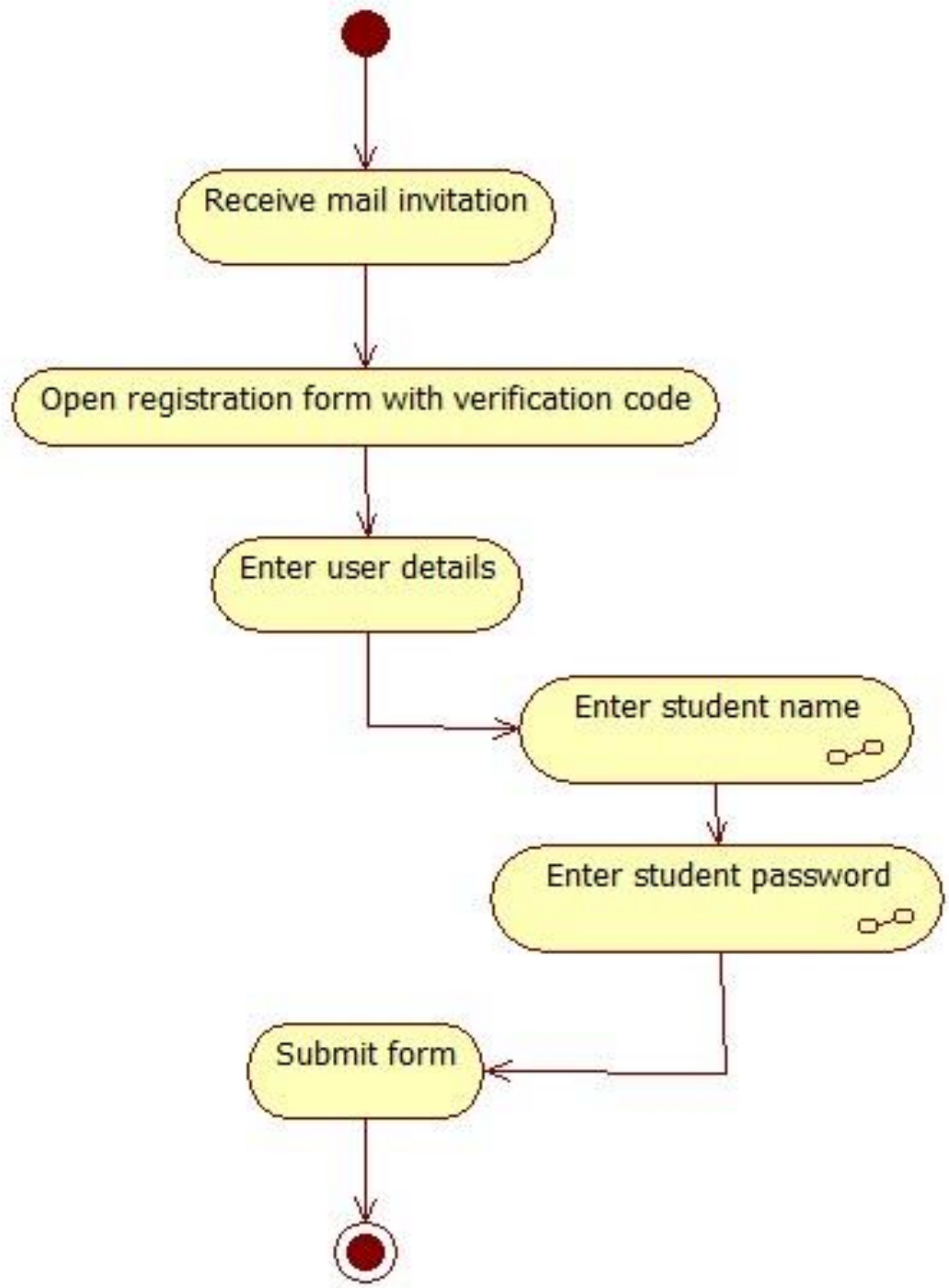

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Figure 14: Activity Diagram-Student Registration

4.2.6. Answer Test Activity Diagram

The Figure 15 illustrates the attempting and answering of the given question with-in the exam.

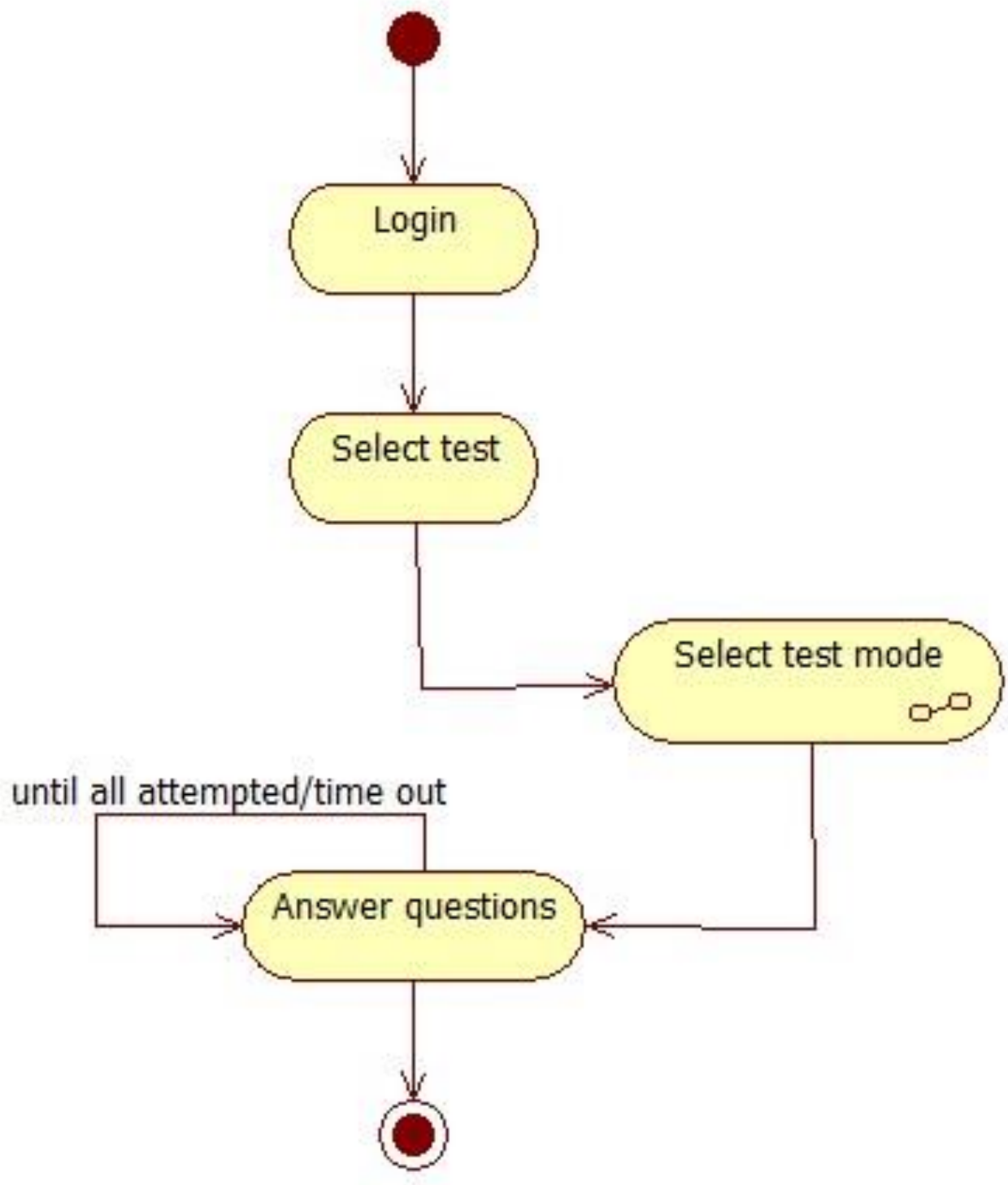


Figure 15: Activity Diagram-Answer Test

4.3. Sequence Diagrams

4.3.1. Sequence Diagram Overview

The Figure 16 illustrates the life span of different entities regarding their work with-in the preferred domain.

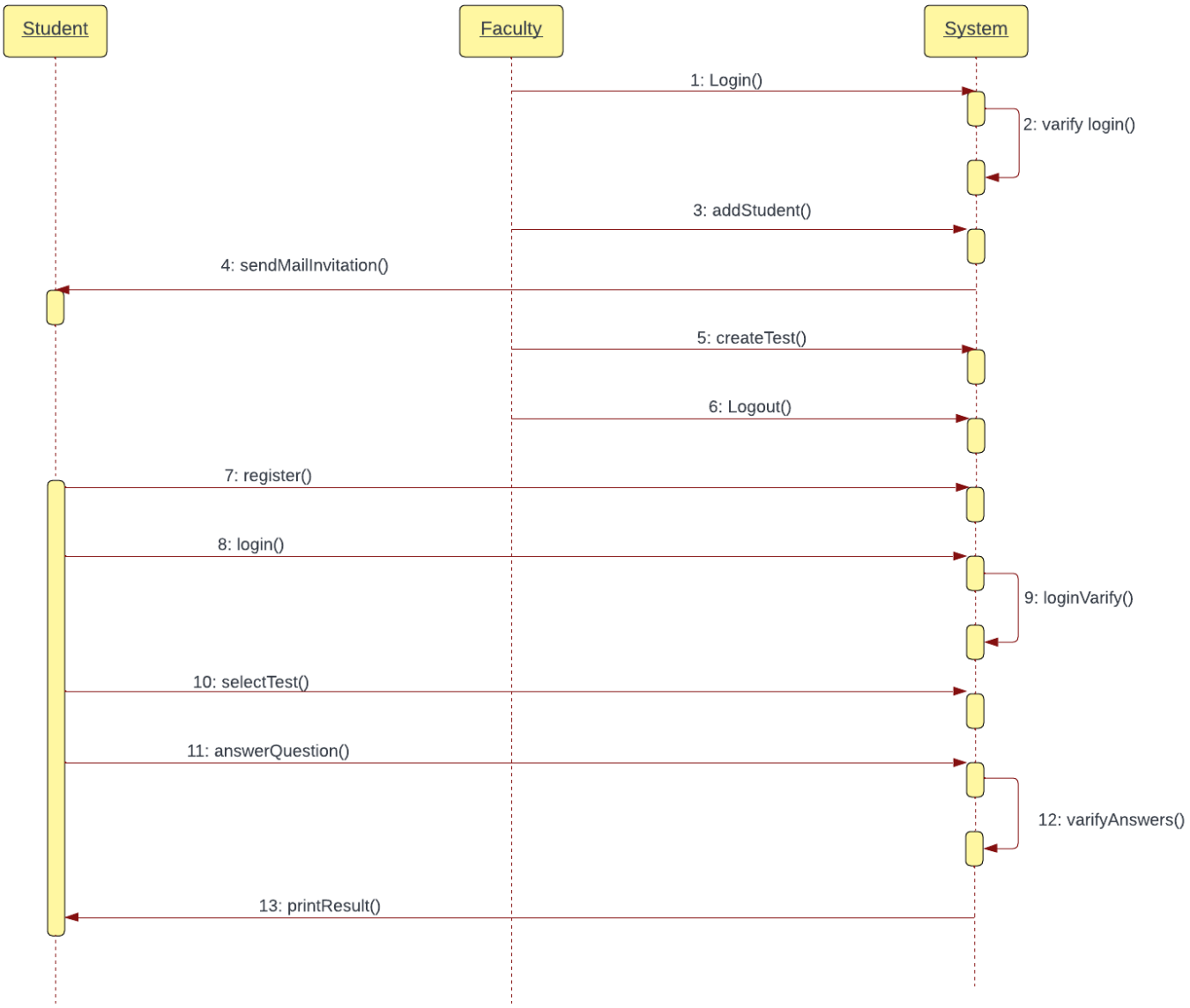


Figure 16: Sequence Diagram-Overview

4.3.2. Login Sequence Diagram

The Figure 17 illustrates how the user log in with the system and it verifies the suer credentials with the database for the session to start.

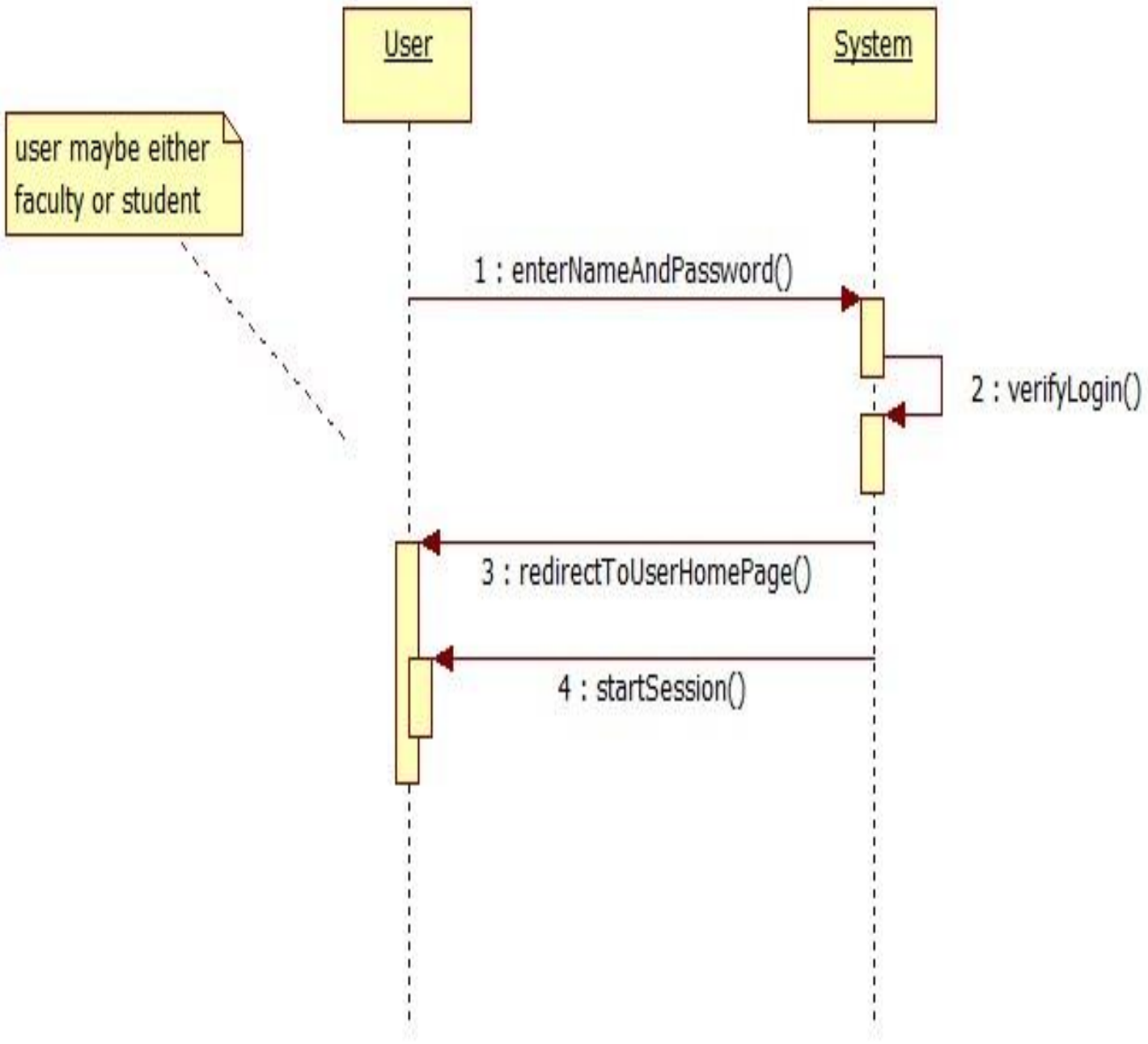


Figure 17: Sequence Diagram-Login

4.3.3. Manage Test Sequence Diagram

The Figure 18 illustrates how the faculty within its lifespan creates test and then modifies it.

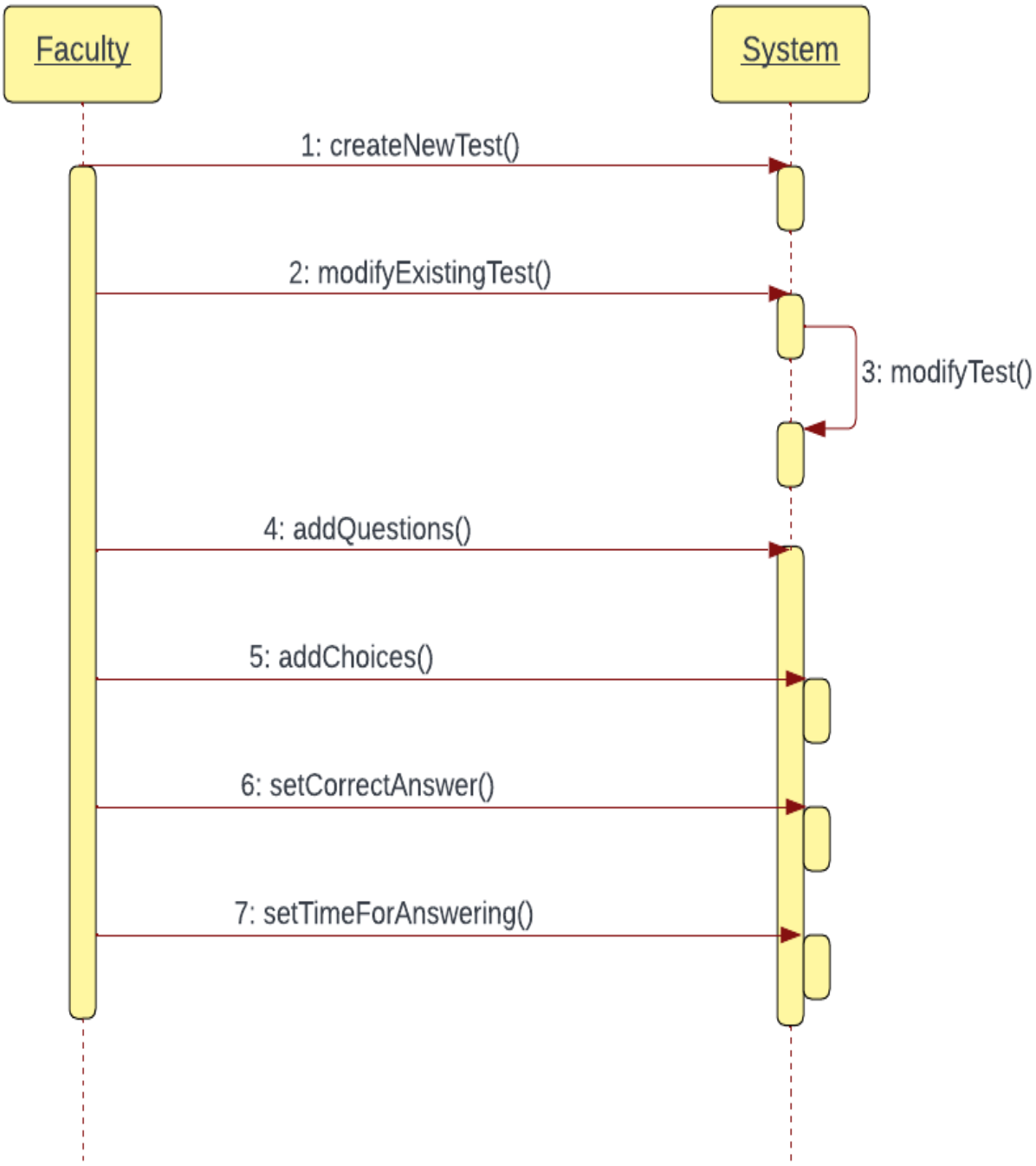


Figure 18: Sequence Diagram-Manage Test

4.3.4. Appear for Test Sequence Diagram

The Figure 19 illustrates the student selecting its test and then selecting on which mode he/she wants to give the exam.

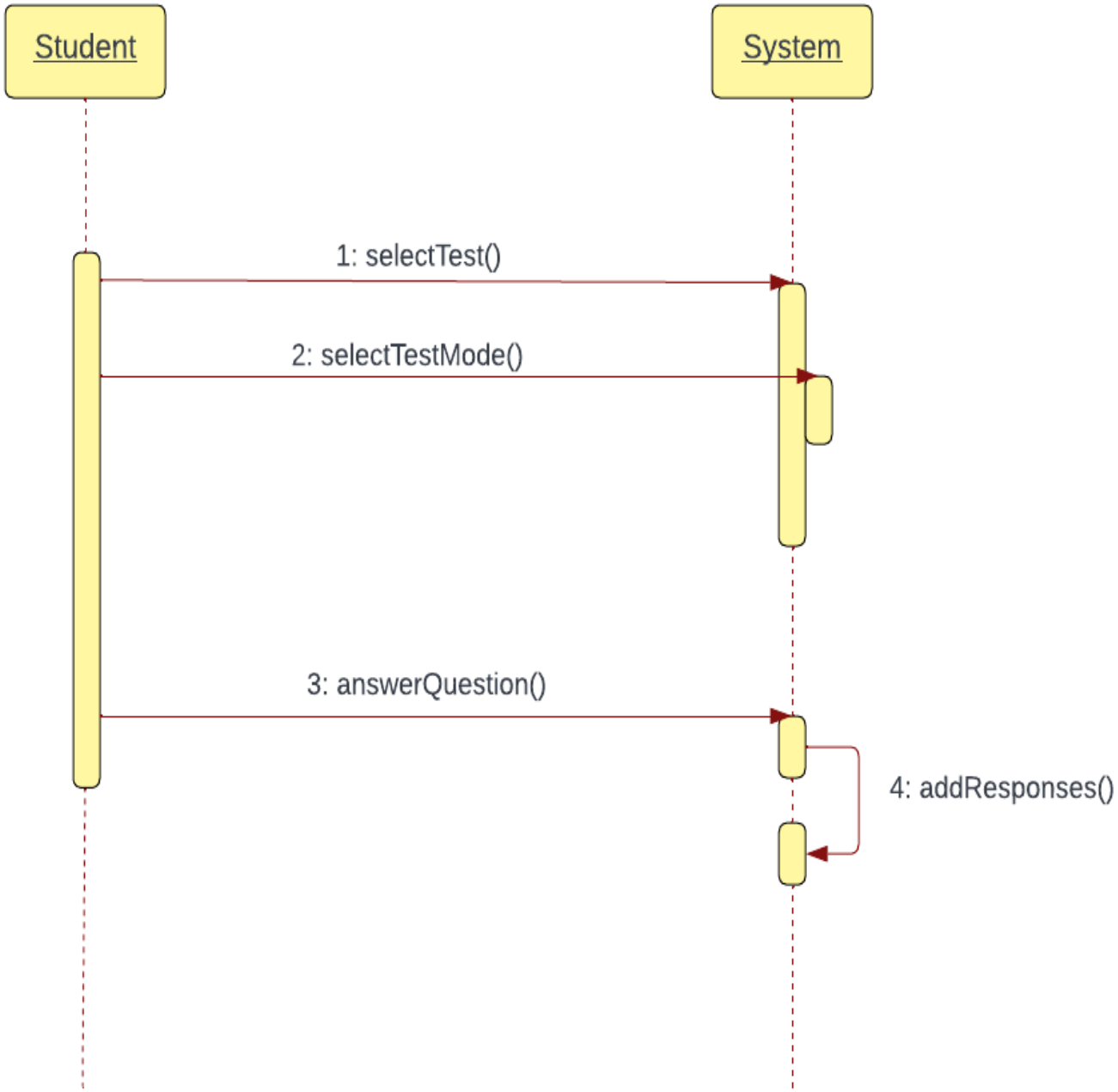


Figure 19: Sequence Diagram-Appear for Test

4.4. Class Diagram

The Figure 20 illustrates all the entities and their involved relationship within the domain and how the perform different operations to get their job done.

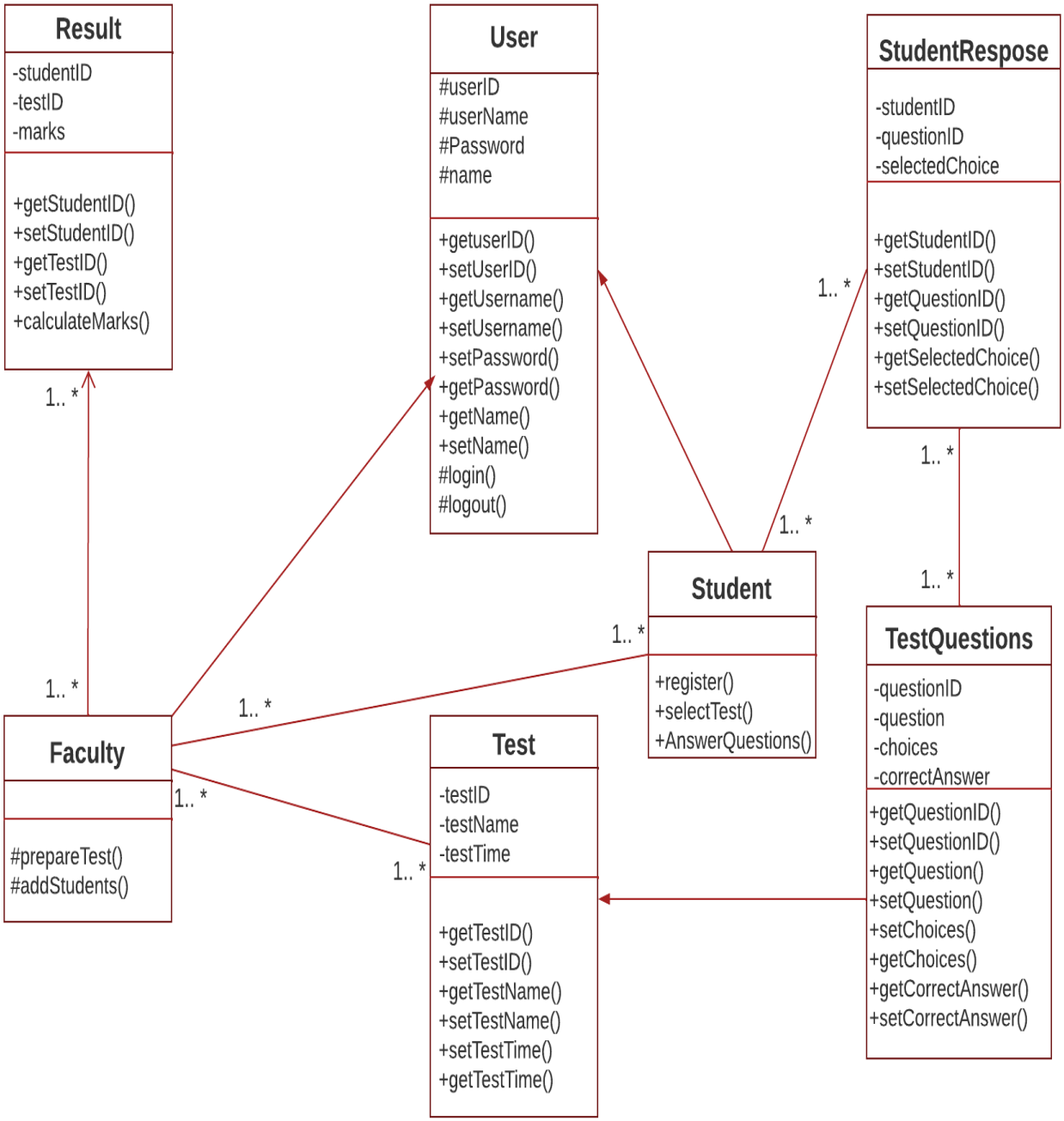


Figure 20: Class Diagram

4.5. Database Design

The Figure 21 illustrates the design of database and how the primary keys and foreign keys are interacting with one another.

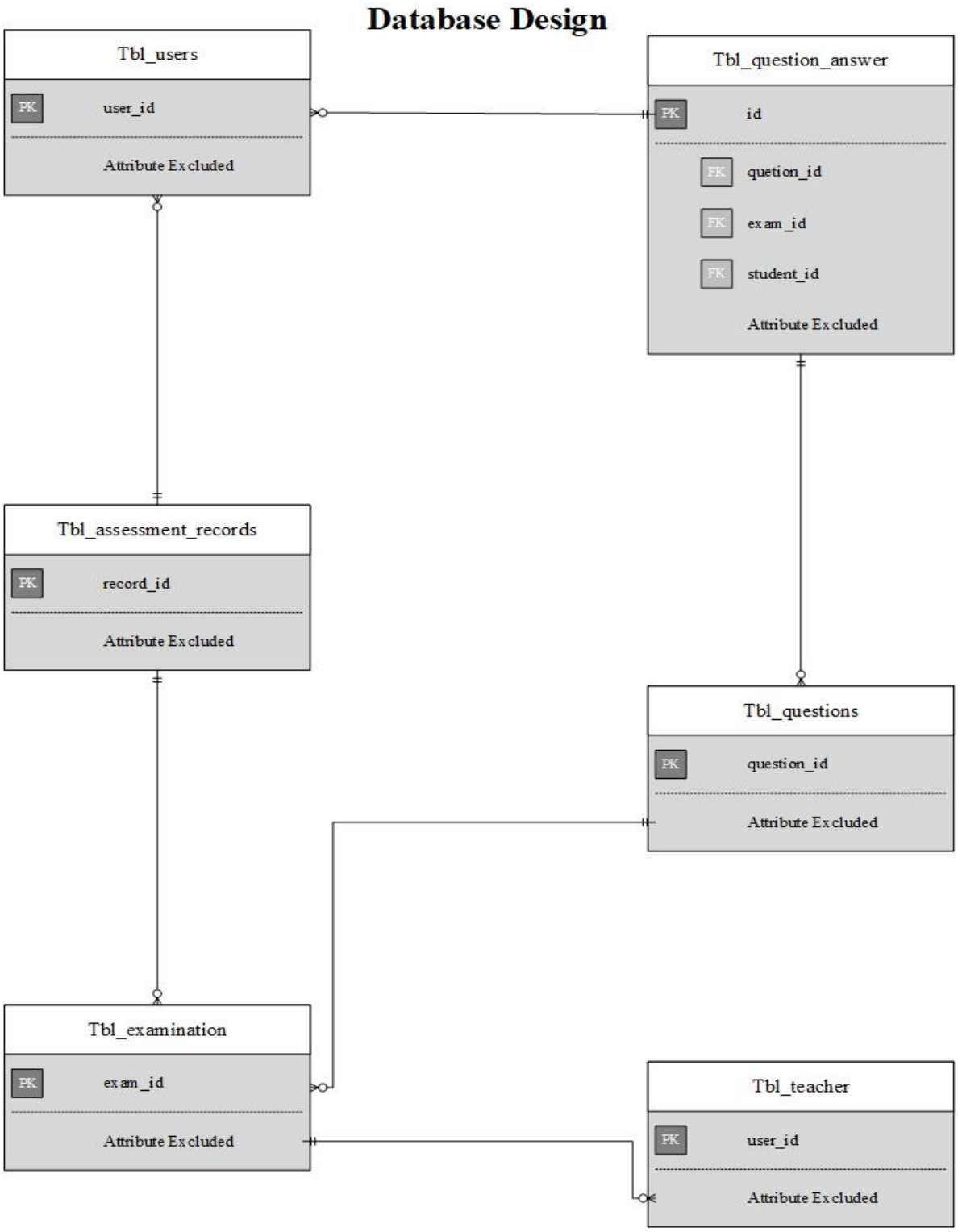


Figure 21: Database Design

4.6. Tables

4.6.1. Table: Tbl_users

The Table 3 illustrates the credentials of user within database of the system.

#	Name	Datatype	Length/Set	Unsign...	Allow N...	Zerofill	Default	Comment	Collation
1	**user_id**	**VARCHAR**	**255**	☐	☐	☐	**No default**		**latin1_swedish_ci**
2	first_name	VARCHAR	255	☐	☐	☐	No default		latin1_swedish_ci
3	last_name	VARCHAR	255	☐	☐	☐	No default		latin1_swedish_ci
4	gender	VARCHAR	255	☐	☐	☐	No default		latin1_swedish_ci
5	dob	VARCHAR	255	☐	☐	☐	No default		latin1_swedish_ci
6	address	LONGTEXT		☐	☐	☐	No default		latin1_swedish_ci
7	email	VARCHAR	255	☐	☐	☐	No default		latin1_swedish_ci
8	phone	VARCHAR	255	☐	☐	☐	No default		latin1_swedish_ci
9	department	VARCHAR	255	☐	☐	☐	'-'		latin1_swedish_ci
10	category	VARCHAR	255	☐	☐	☐	'-'		latin1_swedish_ci
11	login	VARCHAR	255	☐	☐	☐	'e10adc3949ba59...		latin1_swedish_ci
12	role	VARCHAR	255	☐	☐	☐	'student'		latin1_swedish_ci
13	sending_invita...	INT	11	☐	☐	☐	'0'		
14	avatar	LONGBLOB		☐	☑	☐	NULL		
15	acc_stat	VARCHAR	255	☐	☐	☐	'1'		latin1_swedish_ci

Table 3: Database Table-User

4.6.2. Table: Tbl_teacher

The Table 4 illustrates the credentials of teacher within database of the system.

#	Name	Datatype	Length/Set	Unsign...	Allow N...	Zerofill	Default	Comment	Collation	Expression
1	**user_id**	**VARCHAR**	**50**	☐	☐	☐	**No default**		**latin1_swedish_ci**	
2	first_name	VARCHAR	50	☐	☑	☐	NULL		latin1_swedish_ci	
3	last_name	VARCHAR	50	☐	☑	☐	NULL		latin1_swedish_ci	
4	gender	VARCHAR	50	☐	☑	☐	NULL		latin1_swedish_ci	
5	dob	VARCHAR	50	☐	☑	☐	NULL		latin1_swedish_ci	
6	address	VARCHAR	50	☐	☑	☐	NULL		latin1_swedish_ci	
7	email	VARCHAR	50	☐	☑	☐	NULL		latin1_swedish_ci	
8	phone	VARCHAR	50	☐	☑	☐	NULL		latin1_swedish_ci	
9	department	VARCHAR	50	☐	☑	☐	NULL		latin1_swedish_ci	
10	category	VARCHAR	50	☐	☑	☐	NULL		latin1_swedish_ci	
11	role	VARCHAR	50	☐	☑	☐	'teacher'		latin1_swedish_ci	
12	acc_stat	VARCHAR	50	☐	☑	☐	'1'		latin1_swedish_ci	
13	login	VARCHAR	50	☐	☑	☐	'1'		latin1_swedish_ci	
14	avatar	LONGTEXT		☐	☑	☐	NULL		latin1_swedish_ci	

Table 4:Database Table-Teacher

4.6.3. Table: Tbl_subjects

The Table 5 illustrates the various subjects being taught by the teachers within database of the system.

#	Name	Datatype	Length/Set	Unsign...	Allow N...	Zerofill	Default	Comment	Collation
1	**subject_id**	**VARCHAR**	**255**	☐	☐	☐	**No default**		**latin1_swedish_ci**
2	name	VARCHAR	255	☐	☐	☐	No default		latin1_swedish_ci
3	department	VARCHAR	255	☐	☐	☐	No default		latin1_swedish_ci
4	category	VARCHAR	255	☐	☐	☐	No default		latin1_swedish_ci
5	date_registered	VARCHAR	255	☐	☐	☐	No default		latin1_swedish_ci
6	status	VARCHAR	255	☐	☐	☐	'Active'		latin1_swedish_ci

Table 5: Database Table-Subjects

4.6.4. Table: Tbl_question_answer

The Table 6 illustrates the fields of the questions and answers in the database.

#	Name	Datatype	Length/Set	Unsign...	Allow N...	Zerofill	Default	Comment	Collation
1	**id**	**INT**	**11**	☐	☐	☐	**AUTO_INCREME...**		
2	question_id	VARCHAR	50	☐	☑	☐	NULL		latin1_swedish_ci
3	exam_id	VARCHAR	50	☐	☑	☐	NULL		latin1_swedish_ci
4	student_id	VARCHAR	50	☐	☑	☐	NULL		latin1_swedish_ci
5	answer	TEXT		☐	☑	☐	NULL		latin1_swedish_ci
6	correct_answer	TEXT		☐	☑	☐	NULL		latin1_swedish_ci
7	type	TEXT		☐	☑	☐	NULL		latin1_swedish_ci

Table 6: Database Table-Q&A

4.6.5. Tbl_questions

The Table 7 illustrates the fields and choice of options for MCQS.

#	Name	Datatype	Length/Set	Unsign...	Allow N...	Zerofill	Default	Comment	Collation
1	**question_id**	**VARCHAR**	**255**	☐	☐	☐	**No default**		**latin1_swedish_ci**
2	exam_id	VARCHAR	255	☐	☐	☐	No default		latin1_swedish_ci
3	type	VARCHAR	255	☐	☐	☐	No default		latin1_swedish_ci
4	question	LONGTEXT		☐	☐	☐	No default		latin1_swedish_ci
5	option1	VARCHAR	255	☐	☐	☐	'-'		latin1_swedish_ci
6	option2	VARCHAR	255	☐	☐	☐	'-'		latin1_swedish_ci
7	option3	VARCHAR	255	☐	☐	☐	'-'		latin1_swedish_ci
8	option4	VARCHAR	255	☐	☐	☐	'-'		latin1_swedish_ci
9	answer	VARCHAR	255	☐	☐	☐	No default		latin1_swedish_ci
10	datetime	TIMESTAMP		☐	☐	☐	current_timestam...		

Table 7: Database Table-Questions

4.6.6. Table: Tbl_notice

The Table 8 illustrates the notice fields within database of the system.

#	Name	Datatype	Length/Set	Unsign...	Allow N...	Zerofill	Default	Comment	Collation
1	**id**	**INT**	**255**	☐	☐	☐	**AUTO_INCREME...**		
2	notice_id	VARCHAR	255	☐	☐	☐	No default		latin1_swedish_ci
3	post_date	VARCHAR	255	☐	☐	☐	No default		latin1_swedish_ci
4	last_update	VARCHAR	255	☐	☐	☐	No default		latin1_swedish_ci
5	description	LONGTEXT		☐	☐	☐	No default		latin1_swedish_ci
6	title	VARCHAR	255	☐	☐	☐	No default		latin1_swedish_ci

Table 8: Database Table-Notices

4.6.7. Table: Tbl_examination

The Table 9 illustrates the examination fields within database of the system.

#	Name	Datatype	Length/Set	Unsign...	Allow N...	Zerofill	Default	Comment	Collation
1	**exam_id**	**VARCHAR**	**255**	☐	☐	☐	**No default**		**latin1_swedish_ci**
2	category	VARCHAR	255	☐	☐	☐	No default		latin1_swedish_ci
3	subject	VARCHAR	255	☐	☐	☐	No default		latin1_swedish_ci
4	exam_name	VARCHAR	255	☐	☐	☐	No default		latin1_swedish_ci
5	date	VARCHAR	255	☐	☐	☐	No default		latin1_swedish_ci
6	duration	INT	255	☐	☐	☐	No default		
7	passmark	INT	255	☐	☐	☐	No default		
8	re_exam	INT	255	☐	☐	☐	No default		
9	terms	LONGTEXT		☐	☐	☐	No default		latin1_swedish_ci
10	status	VARCHAR	255	☐	☐	☐	'Inactive'		latin1_swedish_ci

Table 9: Database Table-Examinations

4.6.8. Table: Tbl_departments

The Table 10 illustrates the registered departments fields within database of the system.

#	Name	Datatype	Length/Set	Unsign...	Allow N...	Zerofill	Default	Comment	Collation
1	**department_id**	**VARCHAR**	**255**	☐	☐	☐	**No default**		**latin1_swedish_ci**
2	name	VARCHAR	255	☐	☐	☐	No default		latin1_swedish_ci
3	date_registered	VARCHAR	255	☐	☐	☐	No default		latin1_swedish_ci
4	status	VARCHAR	255	☐	☐	☐	'Active'		latin1_swedish_ci

Table 10: Database Table-Departments

4.6.9. Table: Tbl_categories

The Table 11 illustrates the categories of the department fields within database of the system.

#	Name	Datatype	Length/Set	Unsign...	Allow N...	Zerofill	Default	Comment	Collation
1	**category_id**	**VARCHAR**	**255**	☐	☐	☐	**No default**		**latin1_swedish_ci**
2	name	VARCHAR	255	☐	☐	☐	No default		latin1_swedish_ci
3	department	VARCHAR	255	☐	☐	☐	No default		latin1_swedish_ci
4	date_registered	VARCHAR	255	☐	☐	☐	No default		latin1_swedish_ci
5	status	VARCHAR	255	☐	☐	☐	'Active'		latin1_swedish_ci

Table 11: Database Table-Categories

4.6.10. Table: Tbl_assessment_records

The Table 12 illustrates the assessment record fields within database of the system.

#	Name	Datatype	Length/Set	Unsign...	Allow N...	Zerofill	Default	Comment	Collation
1	**record_id**	**VARCHAR**	**255**	☐	☐	☐	**No default**		**latin1_swedish_ci**
2	student_id	VARCHAR	255	☐	☐	☐	No default		latin1_swedish_ci
3	student_name	VARCHAR	255	☐	☐	☐	No default		latin1_swedish_ci
4	exam_name	VARCHAR	255	☐	☐	☐	No default		latin1_swedish_ci
5	exam_id	VARCHAR	255	☐	☐	☐	No default		latin1_swedish_ci
6	score	VARCHAR	255	☐	☐	☐	No default		latin1_swedish_ci
7	status	VARCHAR	255	☐	☐	☐	No default		latin1_swedish_ci
8	next_retake	VARCHAR	255	☐	☐	☐	No default		latin1_swedish_ci
9	date	VARCHAR	255	☐	☐	☐	No default		latin1_swedish_ci

Table 12: Database Table-Assessment Records

4.6.11. Table: Tbl_assessment_practice_records

The Table 13 illustrates the assessment practice record fields within database of the system.

#	Name	Datatype	Length/Set	Unsign...	Allow N...	Zerofill	Default	Comment	Collation
1	**record_id**	**VARCHAR**	**255**	☐	☐	☐	**No default**		**latin1_swedish_ci**
2	student_id	VARCHAR	255	☐	☐	☐	No default		latin1_swedish_ci
3	student_name	VARCHAR	255	☐	☐	☐	No default		latin1_swedish_ci
4	exam_name	VARCHAR	255	☐	☐	☐	No default		latin1_swedish_ci
5	exam_id	VARCHAR	255	☐	☐	☐	No default		latin1_swedish_ci
6	score	VARCHAR	255	☐	☐	☐	No default		latin1_swedish_ci
7	status	VARCHAR	255	☐	☐	☐	No default		latin1_swedish_ci
8	next_retake	VARCHAR	255	☐	☐	☐	No default		latin1_swedish_ci
9	date	VARCHAR	255	☐	☐	☐	No default		latin1_swedish_ci

Table 13: Database Table-Practice Record

4.6.12. Table: Tbl_alerts

The Table 14 illustrates the alert fields within database of the system.

#	Name	Datatype	Length/Set	Unsign...	Allow N...	Zerofill	Default	Comment	Collation
1	id	INT	255	☐	☐	☐	AUTO_INCREME...		
2	code	VARCHAR	255	☐	☐	☐	No default		latin1_swedish_ci
3	description	VARCHAR	255	☐	☐	☐	No default		latin1_swedish_ci

Table 14: Database Table-Alerts

Chapter No
5

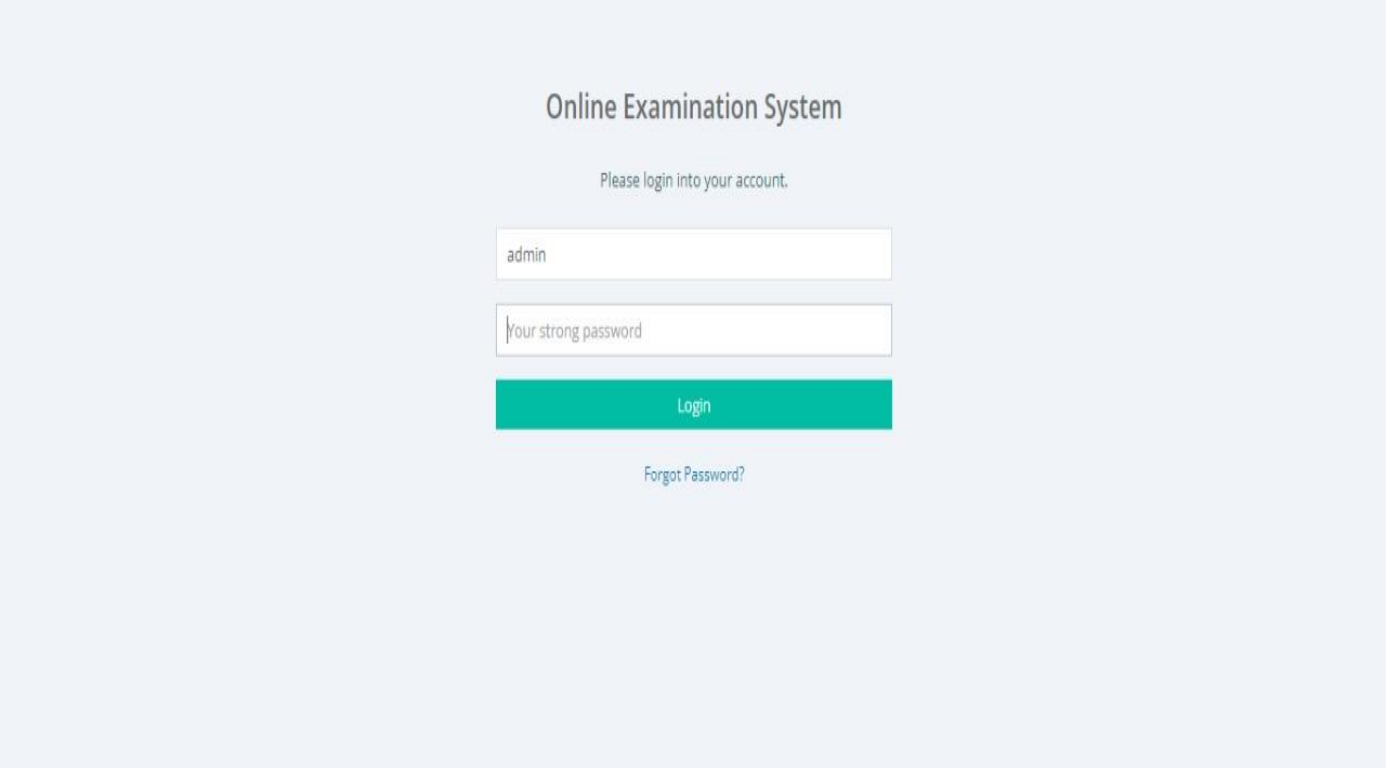
User- Interface

5. User Interface

5.1. Admin Panel

5.1.1. Login

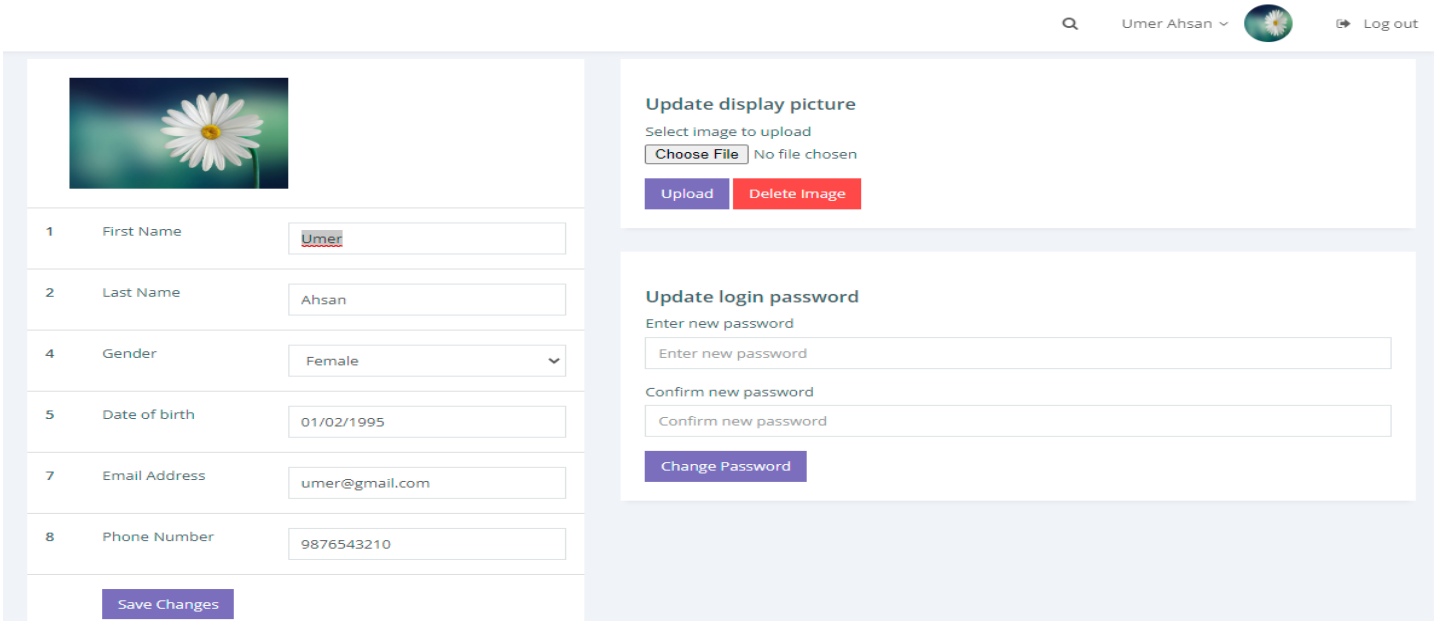
The Screenshot 1 illustrates the admin login for it to use and view all the operations of the system.



Screenshots 1: Admin Login

5.1.2. Admin Profile

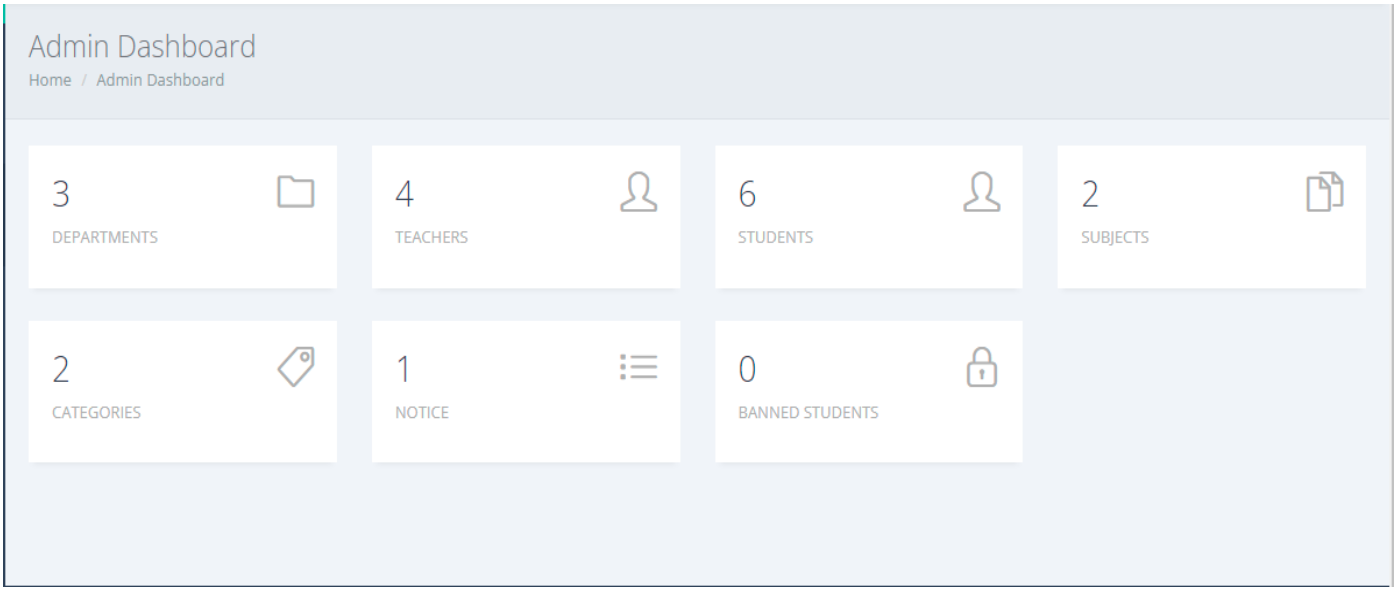
The Screenshot 2 illustrates the details of the admin profile.



Screenshots 2: Admin Profile

5.1.3. Dashboard

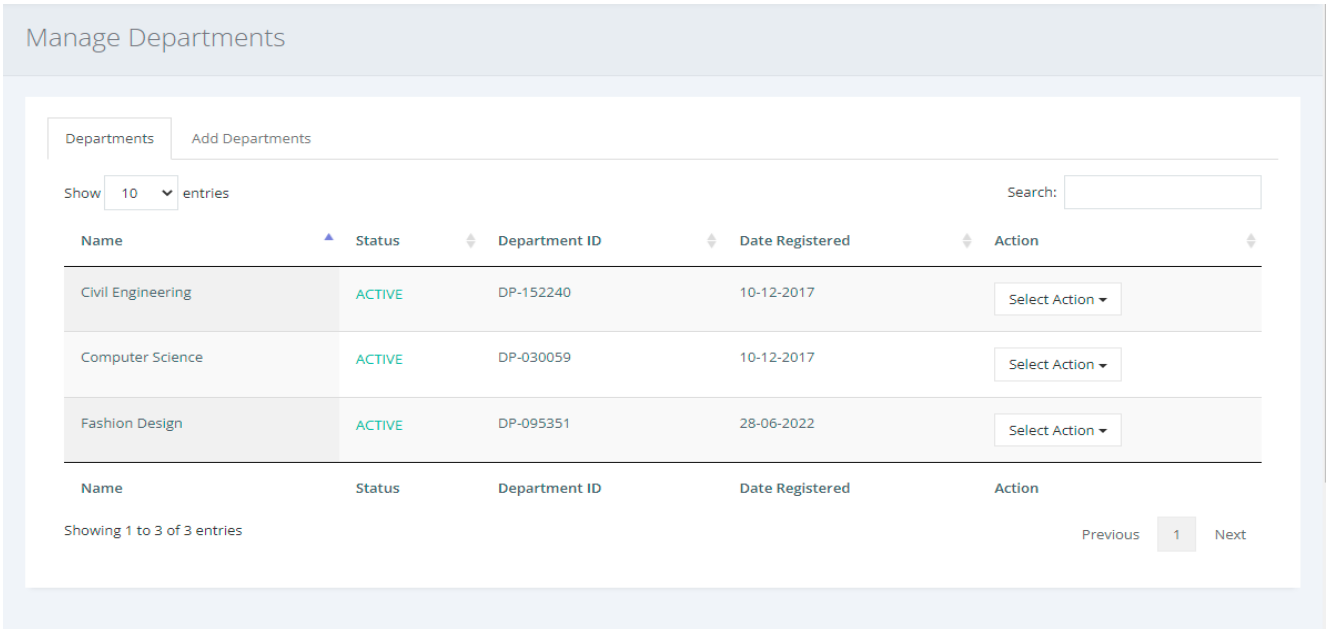
The Screenshot 3 illustrates the operations that can be managed by the admin.



Screenshots 3: Dashboard

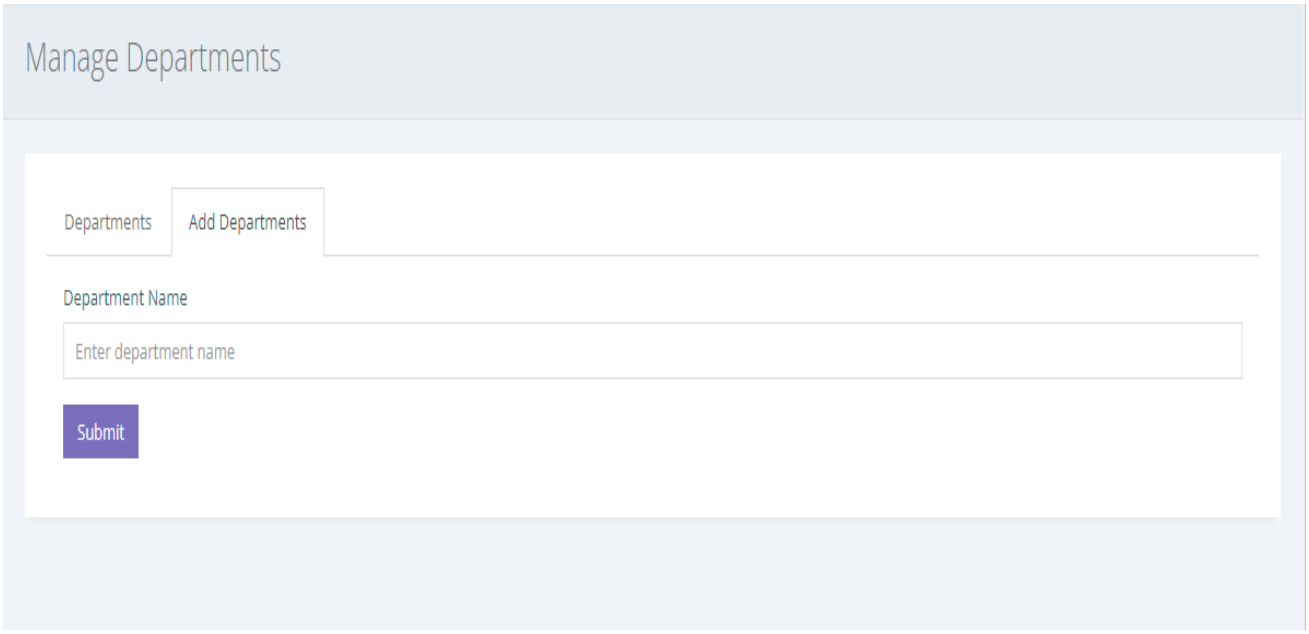
5.1.4.Departments

The Screenshot 4 illustrates the Departments section of the dashboard which contains the status of department whether it is active or not.



Screenshots 4: Manage Department

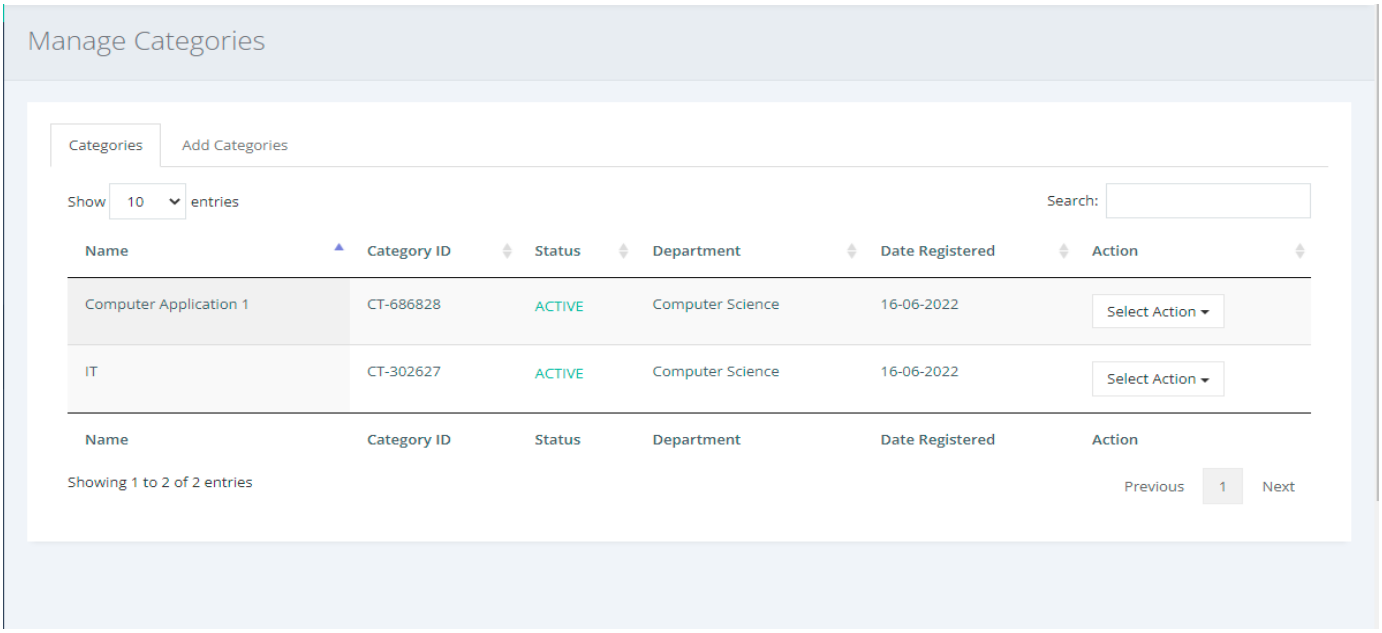
The Screenshot 5 illustrates that admin can add new departments if there in not any available department



Screenshots 5: Add Department

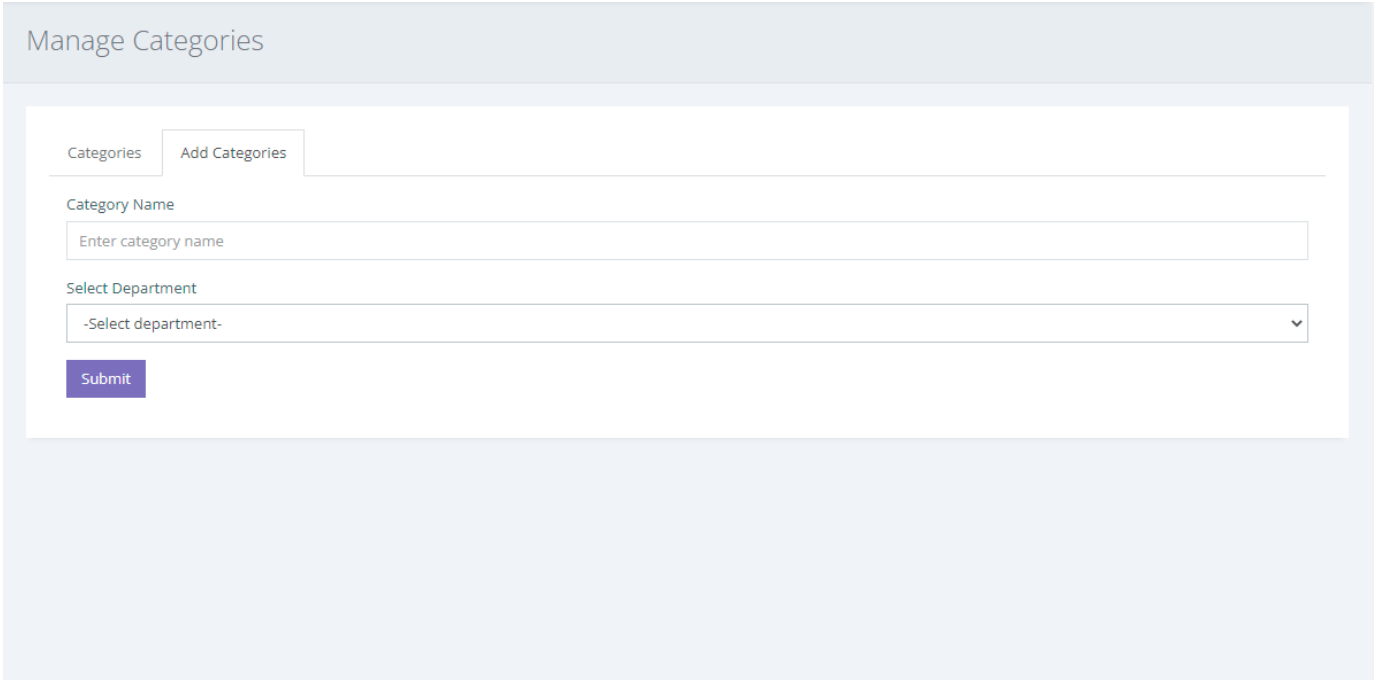
5.1.5. Categories

The Screenshot 6 illustrates the list and status of categories within the department which is controlled by admin



Screenshots 6: Manage Categories

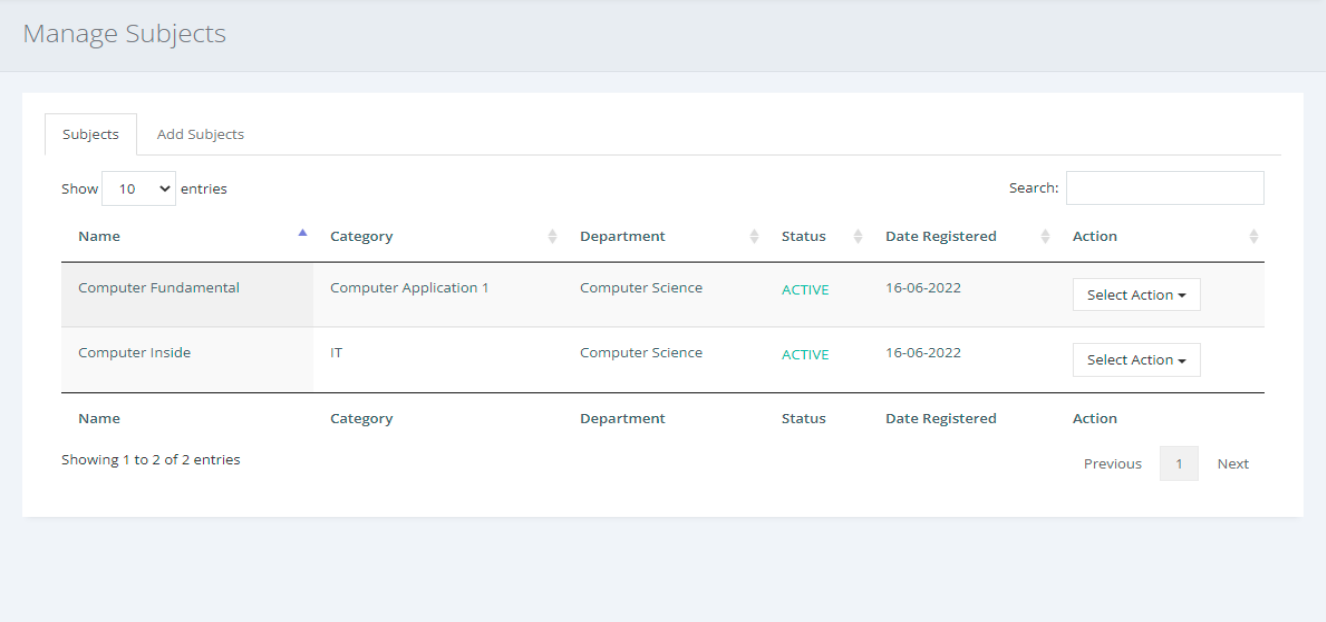
The Screenshot 7 illustrates the addition of new categories related to that department by the admin.



Screenshots 7: Add Categories

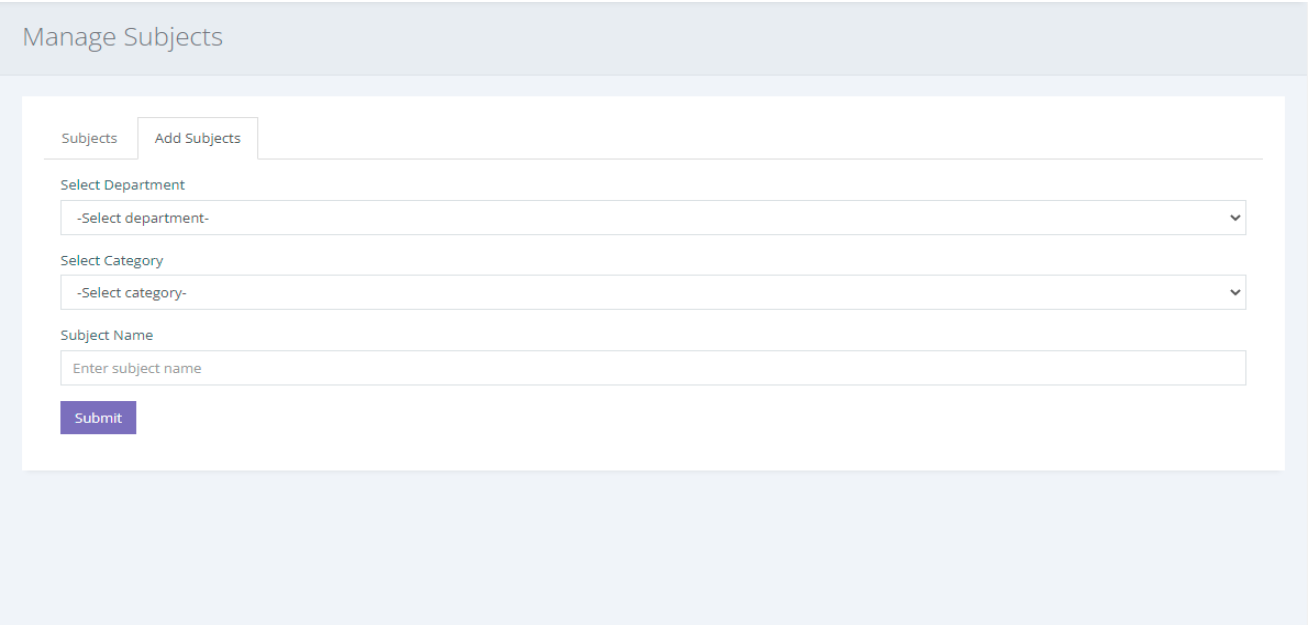
5.1.6. Subjects

The Screenshot 8 illustrates how admin manages subjects within different categories and ensure the status of them



Screenshots 8: Manage Subjects

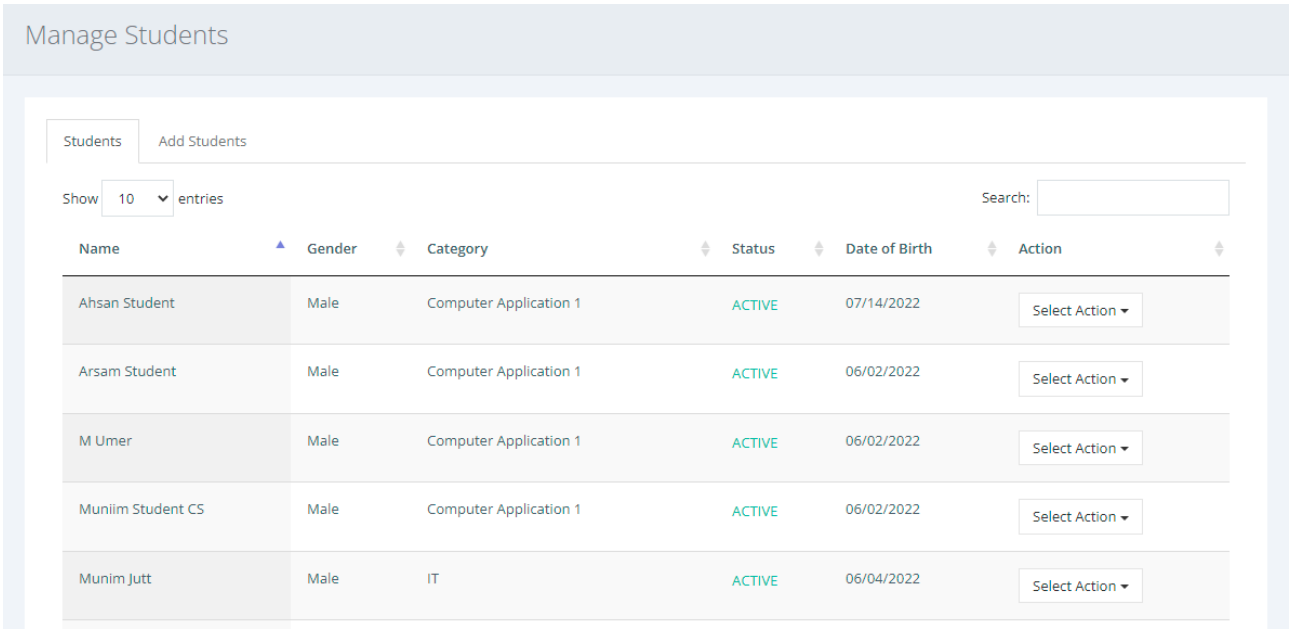
The Screenshot 9 illustrates that admin can add subjects into specific categories of the department



Screenshots 9: Add Subjects

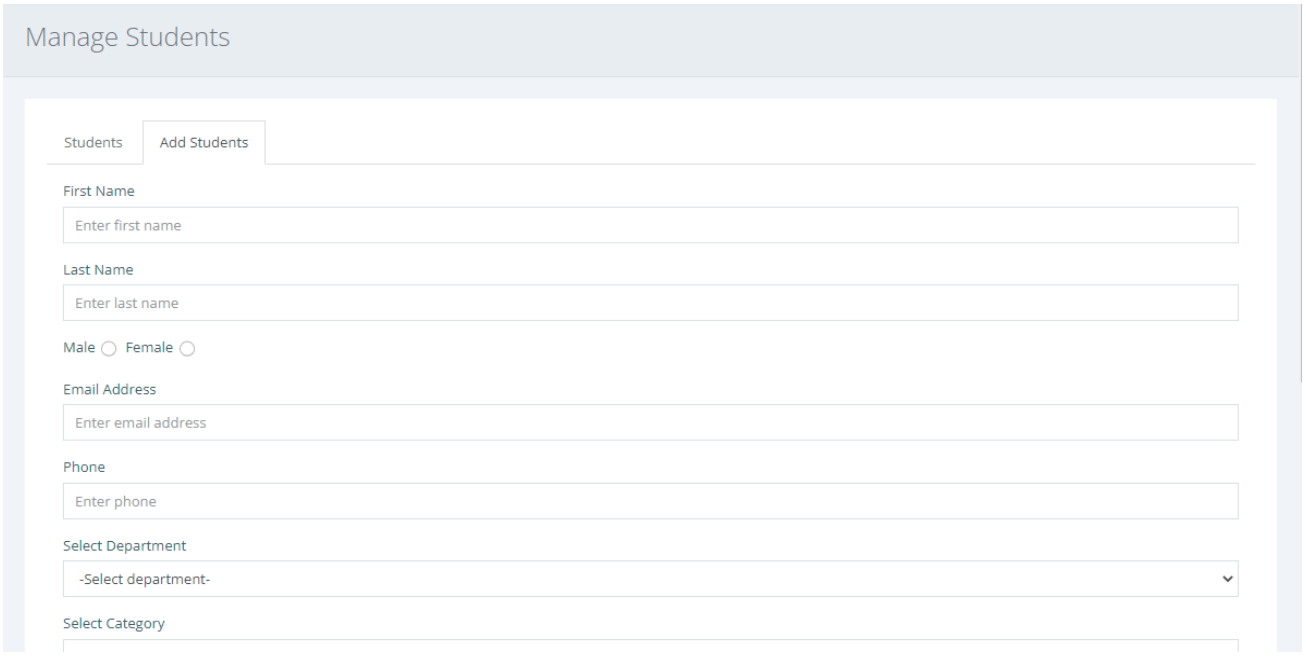
5.1.7. Students

The Screenshot 10 illustrates that admin can manage student credentials and can block-list them by dropping them.



Screenshots 10: Manage Students

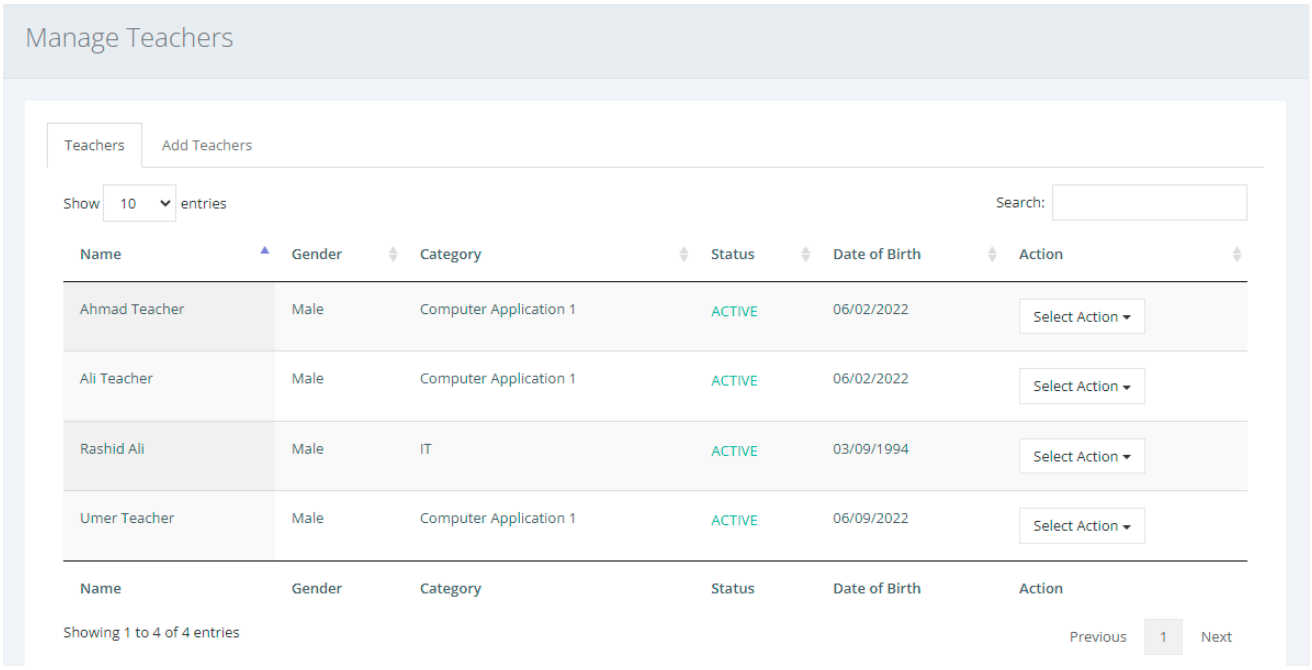
The Screenshot 11 illustrates that admin can student credentials in the database for them to login.



Screenshots 11: Add Students

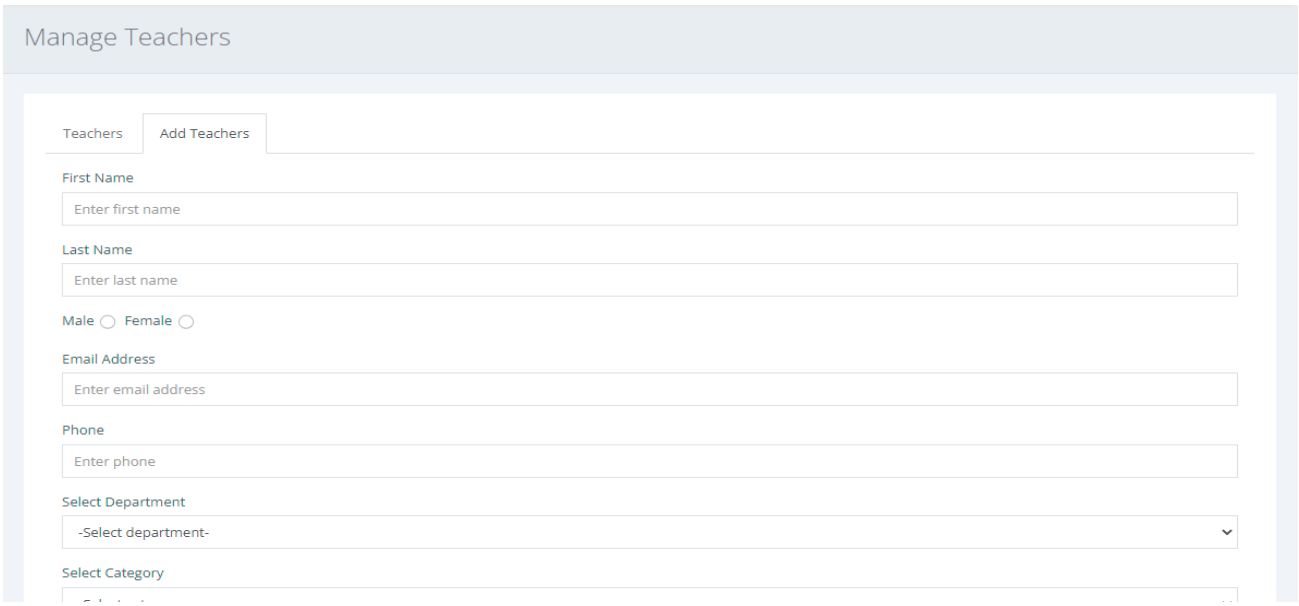
5.1.8. Faculty

The Screenshot 12 illustrates that admin have the control of managing teachers as well and to ensure their proper working.



Screenshots 12: Manage Teachers

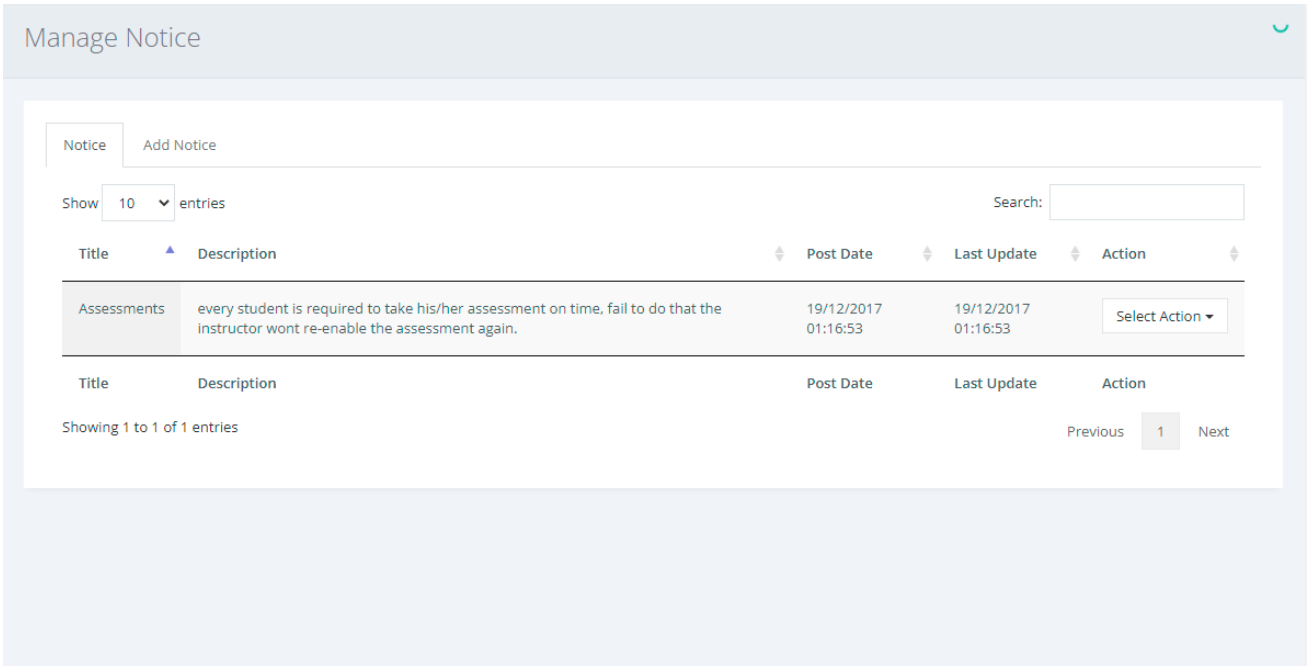
The Screenshot 13 illustrates that only admin can add teachers who will be teaching a particular subject and more than one teacher can teach the same subject as well .



Screenshots 13: Add Teachers

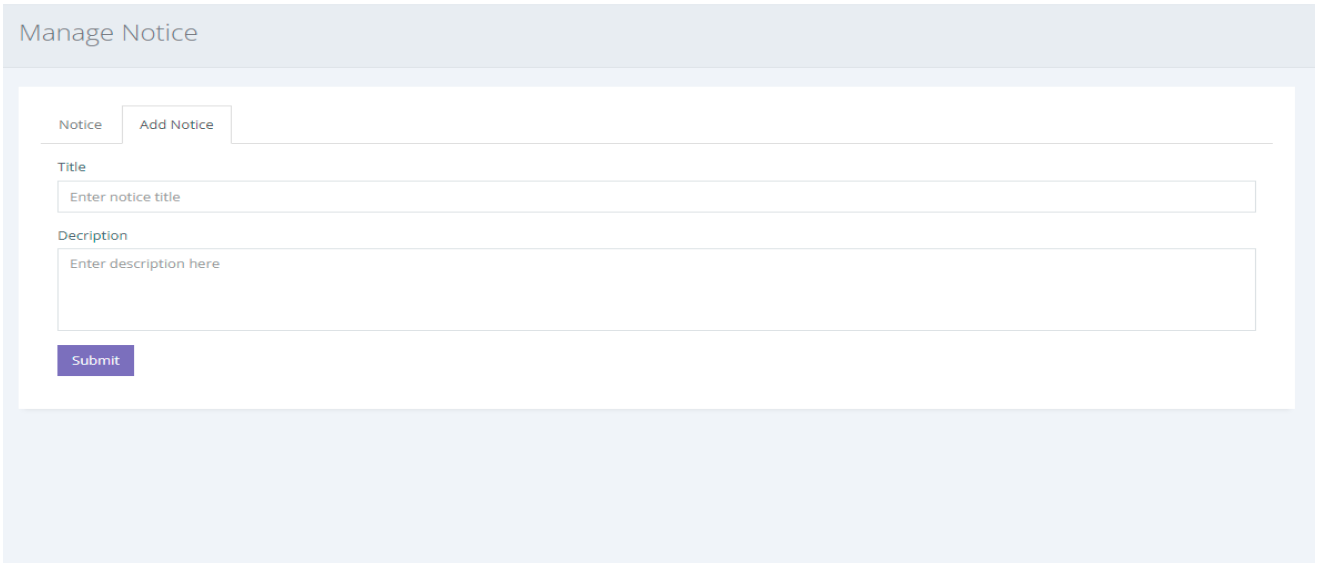
5.1.9. Notice

The Screenshot 14 illustrates that only admin can post and manage notices on the board to be read by students and teaches.



Screenshots 14: Manage Notice

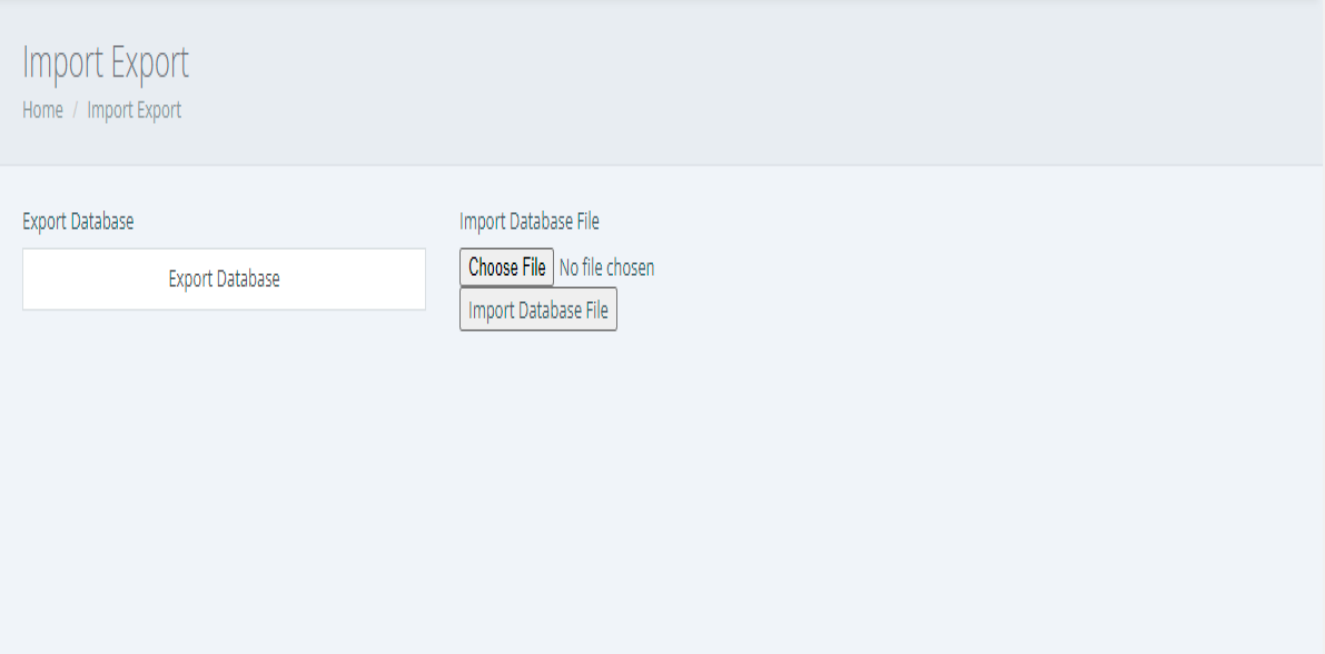
The Screenshot 15 illustrates that only admin can write notice.



Screenshots 15: Add Notice

5.1.10. Export Database

The Screenshot 16 illustrates that admin have the right to make an external copy for backup of the database.

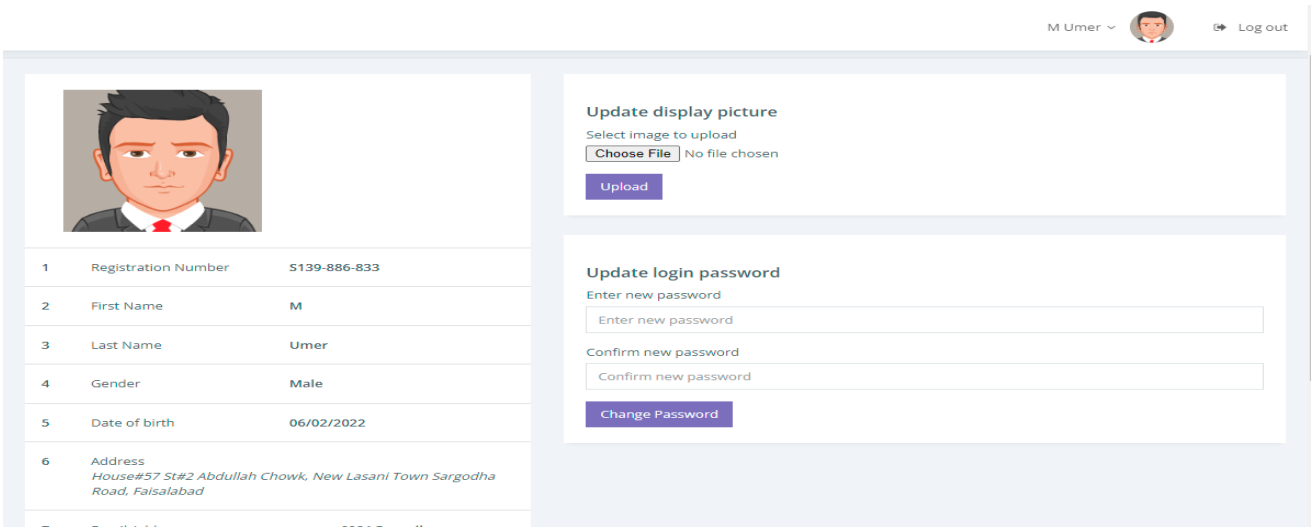


Screenshots 16: Export Database

5.2. Student Panel

5.2.1. Student Profile

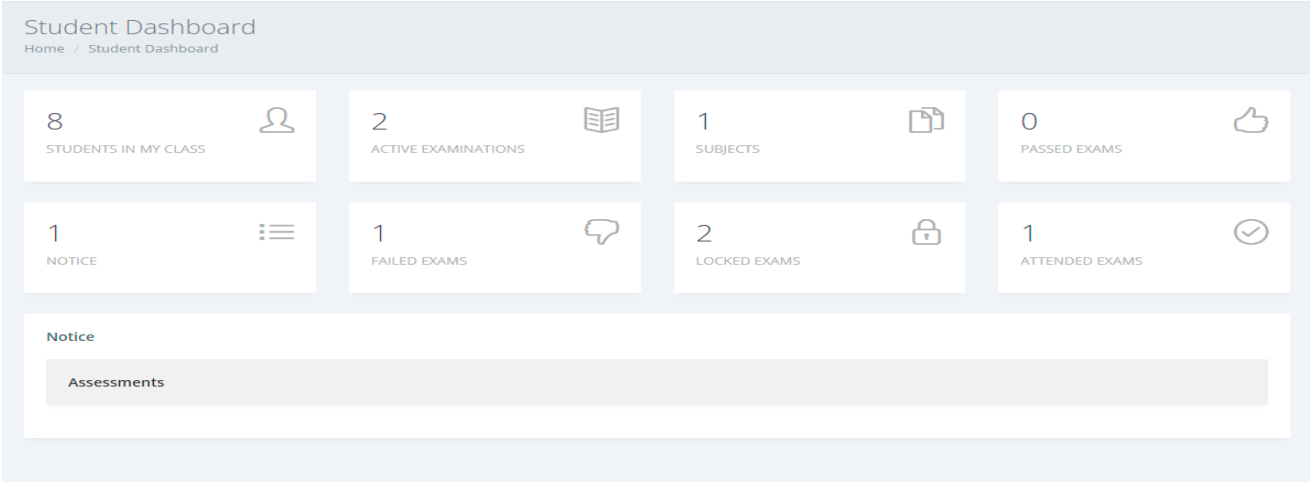
The Screenshot 17 illustrates the student profile with its given credentials.



Screenshots 17: Student Profile

5.2.2. Dashboard

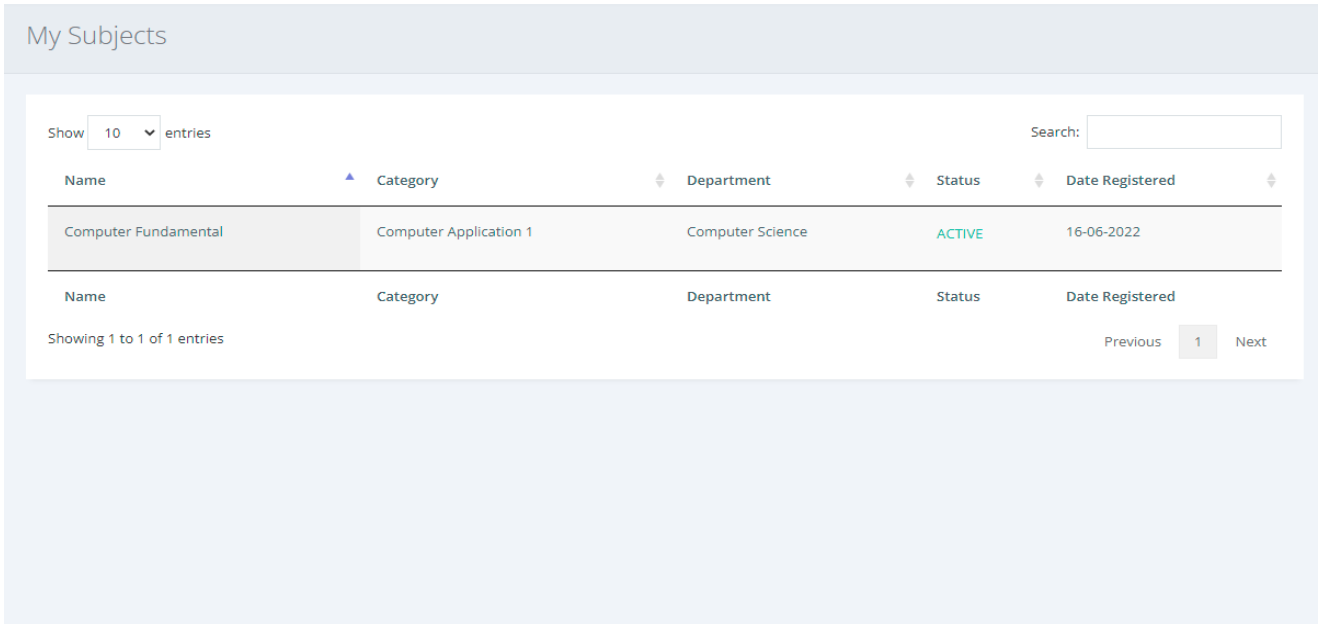
The Screenshot 18 illustrates the options on dashboard for the ease of students.



Screenshots 18: Dashboard

5.2.3. Subjects

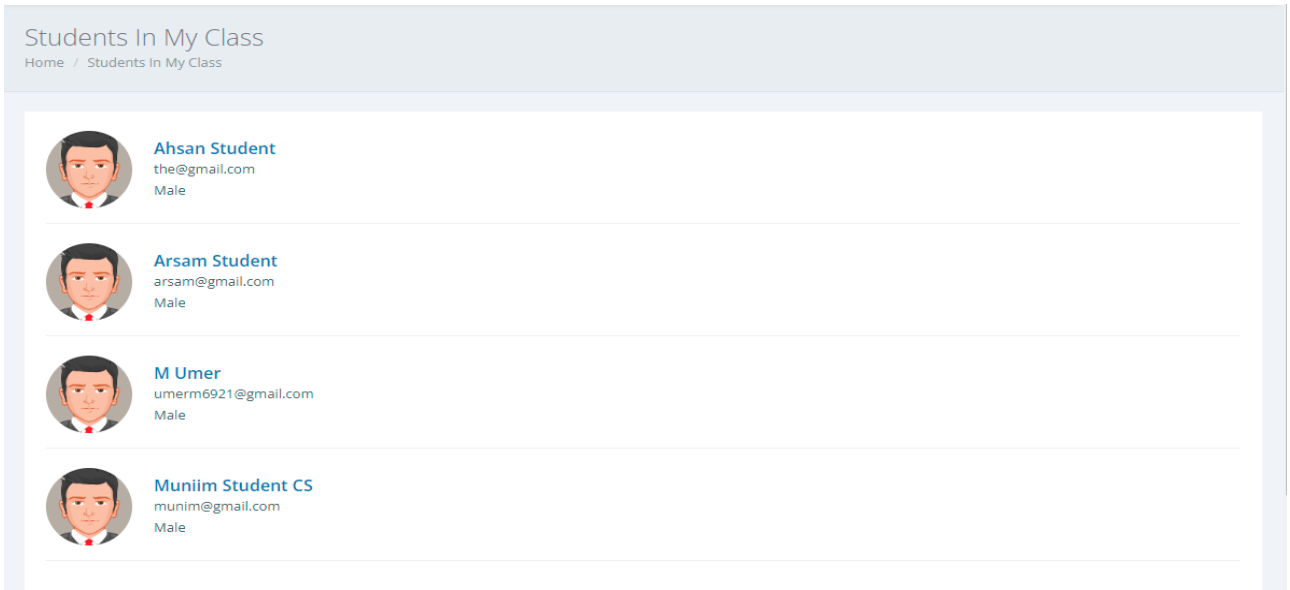
The Screenshot 19 illustrates the subjects the student undertook.



Screenshots 19: Student Subjects

5.2.4. Students

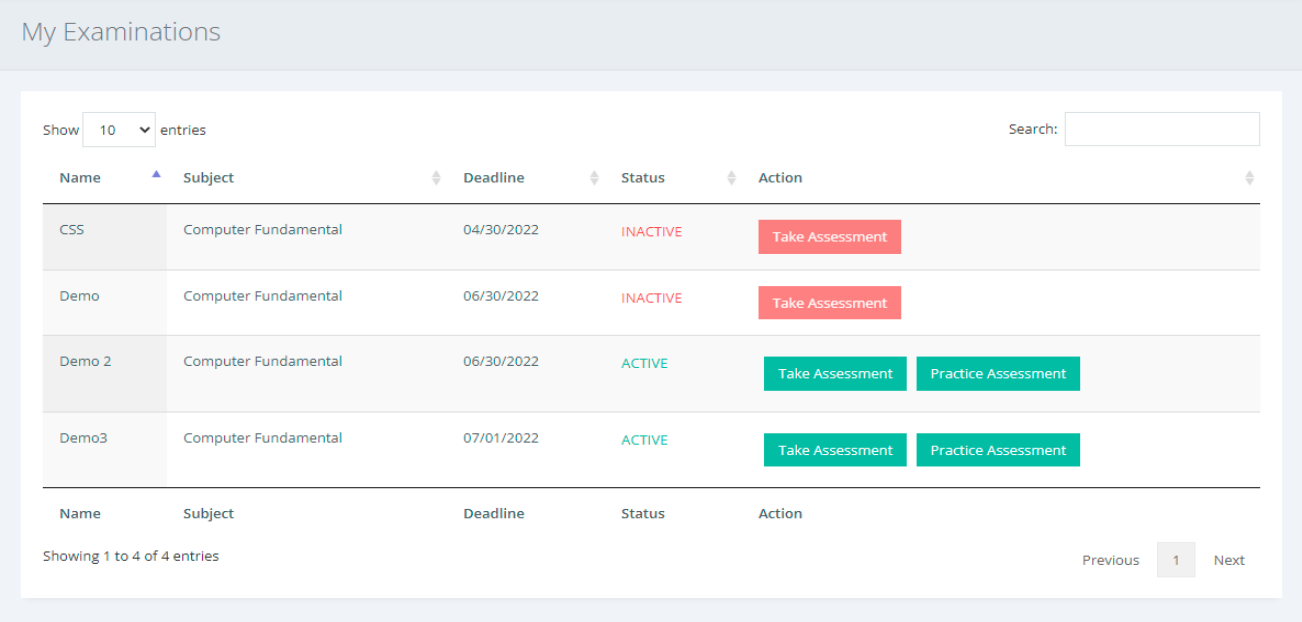
The Screenshot 20 illustrates the other students present in one's class.



Screenshots 20: Students with-in Class

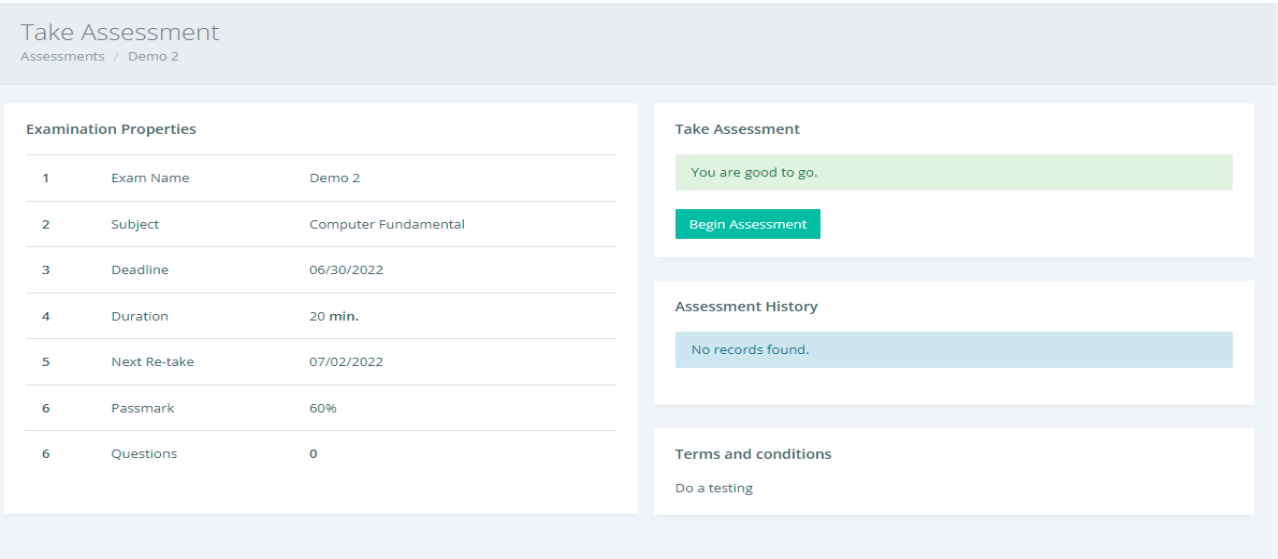
5.2.5. Examination

The Screenshot 21 illustrates the examinations booth either he wants to practice an assessment or wants to give the exam.



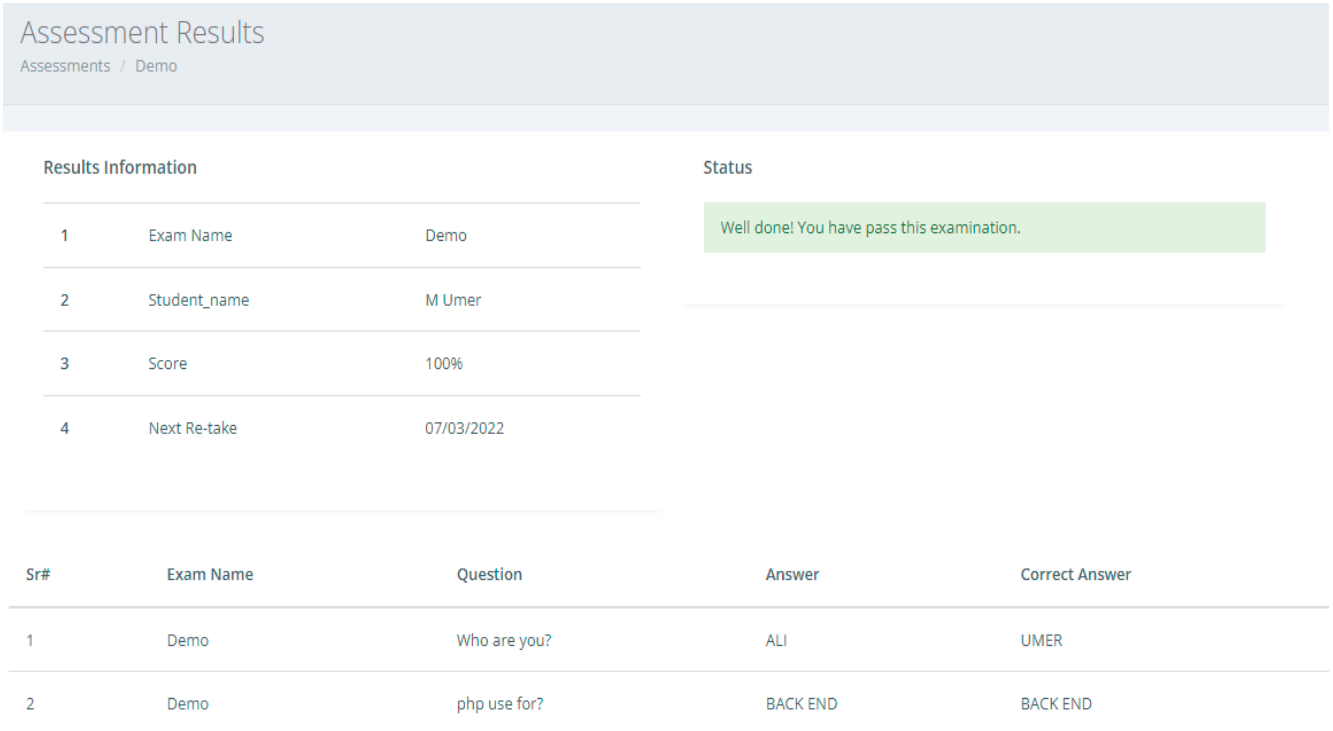
Screenshots 21: Undertaking Exam

The Screenshot 1 illustrates the welcoming screen of the examination on which the student was being with the guidelines of examination.



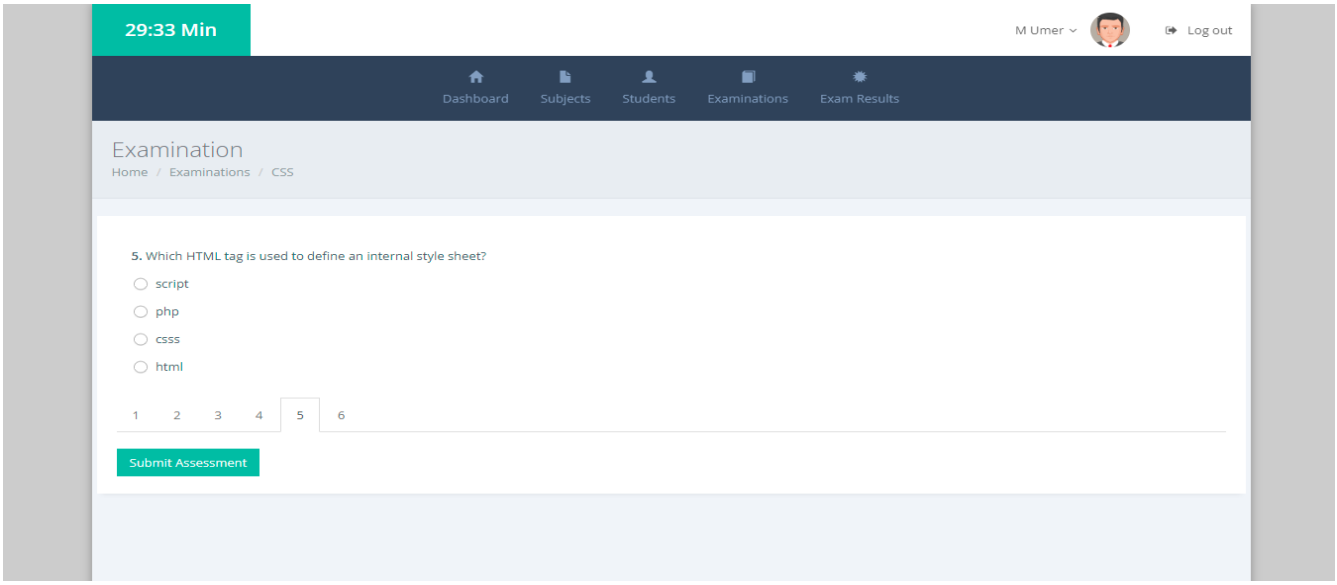
Screenshots 22: Initiating Exam

The Screenshot 23 illustrates the individual result in a particular exam of the subject.



Screenshots 23: Assessment Result

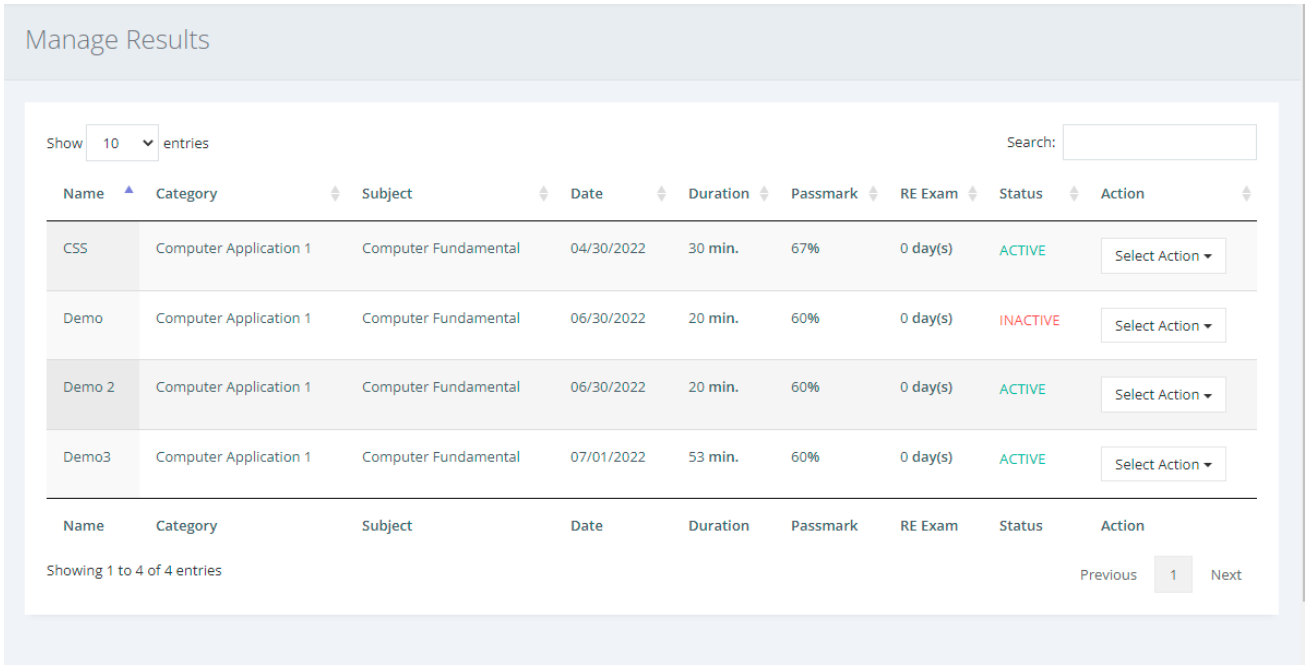
The Screenshot 24 illustrates the on-going exam (MCQS).



Screenshots 24: On-Going Exam

5.2.6. Exam Results

The Screenshot 25 illustrates the overall result of an individual in all subjects.

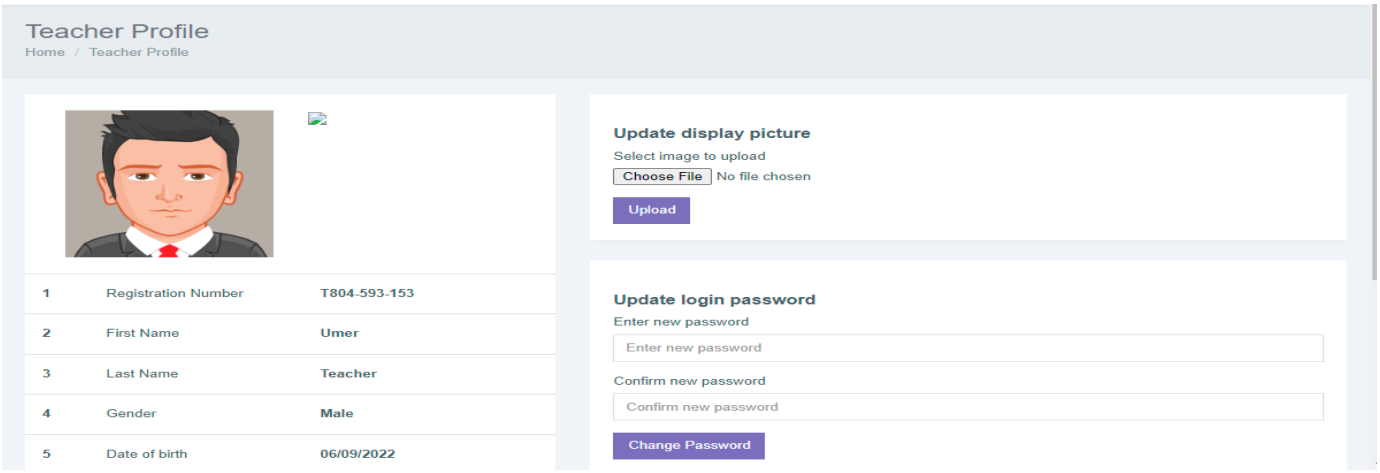


Screenshots 25: Overall Result

5.3. Teacher Panel

5.3.1. Teacher Profile

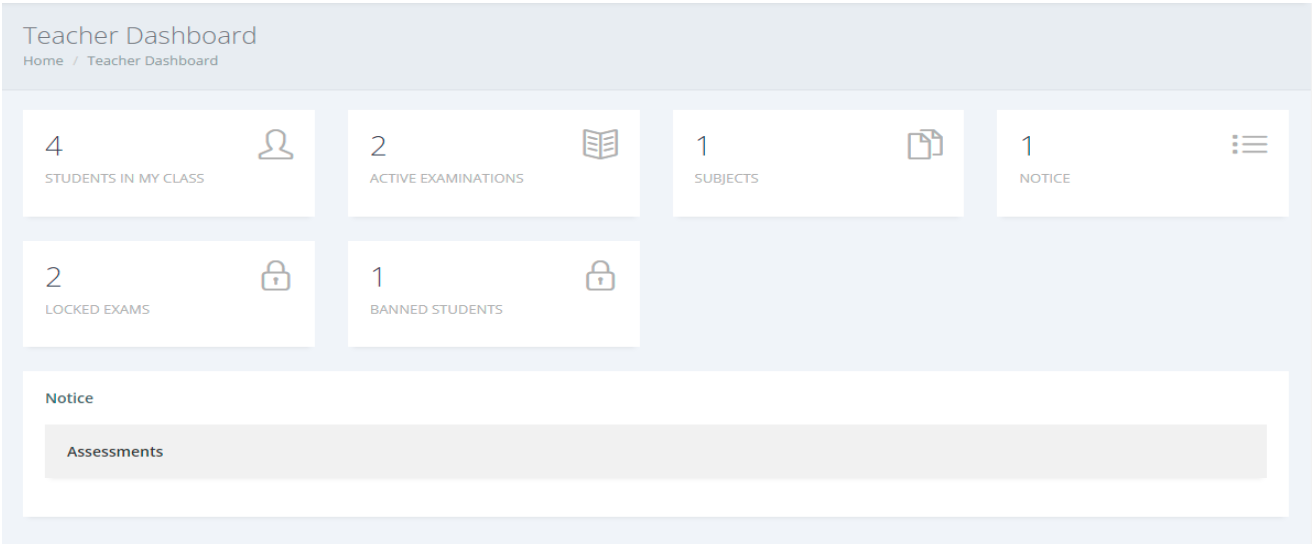
The Screenshot 26 illustrates the teacher profile with all its credentials.



Screenshots 26: Teacher Profile

5.3.2. Dashboard

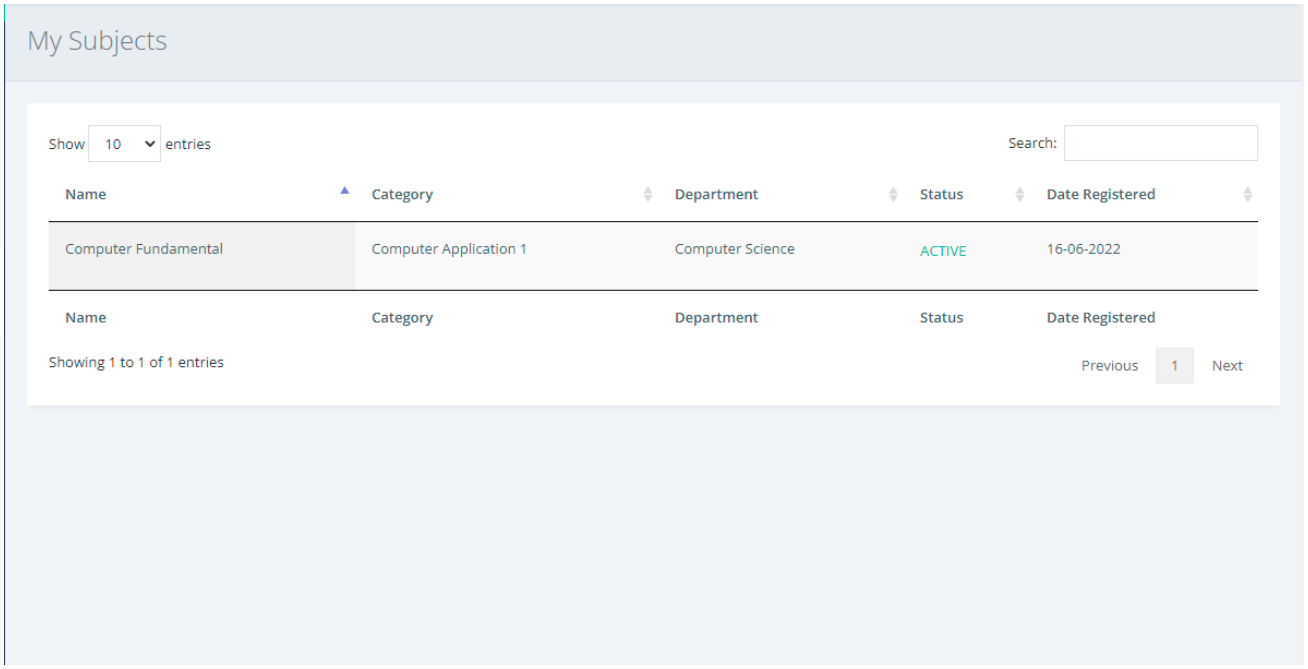
The Screenshot 27 illustrates the list of options on dashboard with which a teacher can manage and control the activities of the students.



Screenshots 27: Teacher Dashboard

5.3.3. Subject

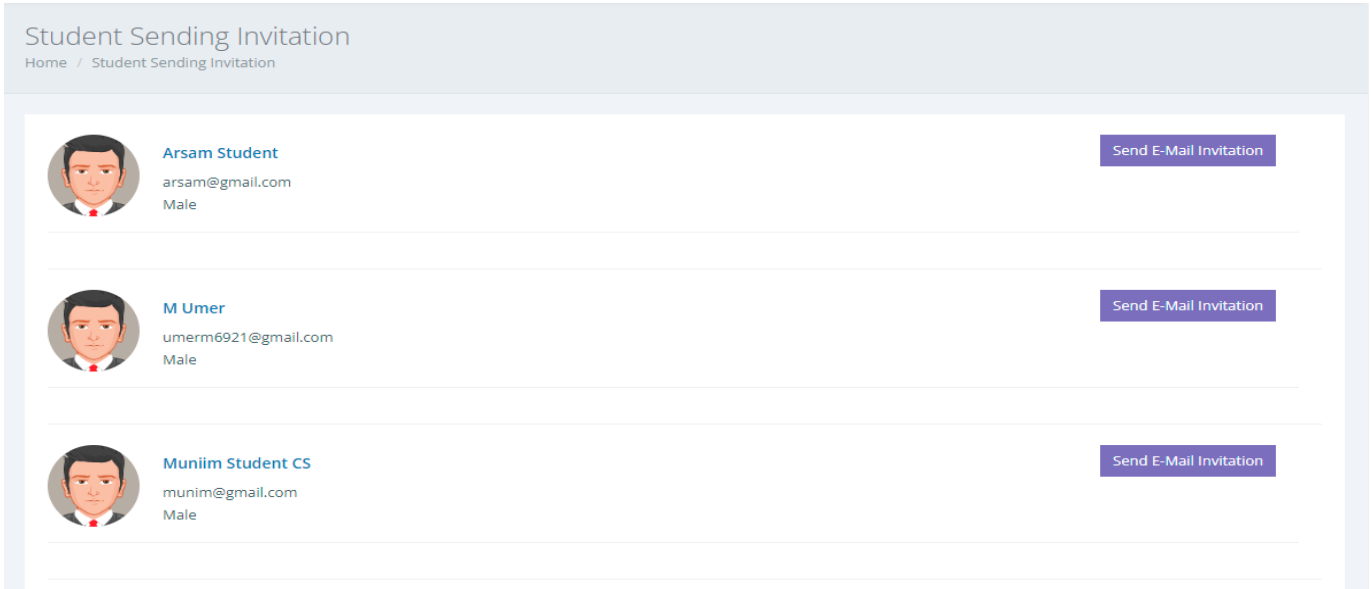
The Screenshot 28 illustrates the subjects taught by the teacher in different categories of department.



Screenshots 28: Teaching Subjects

5.3.4. Send Invitation

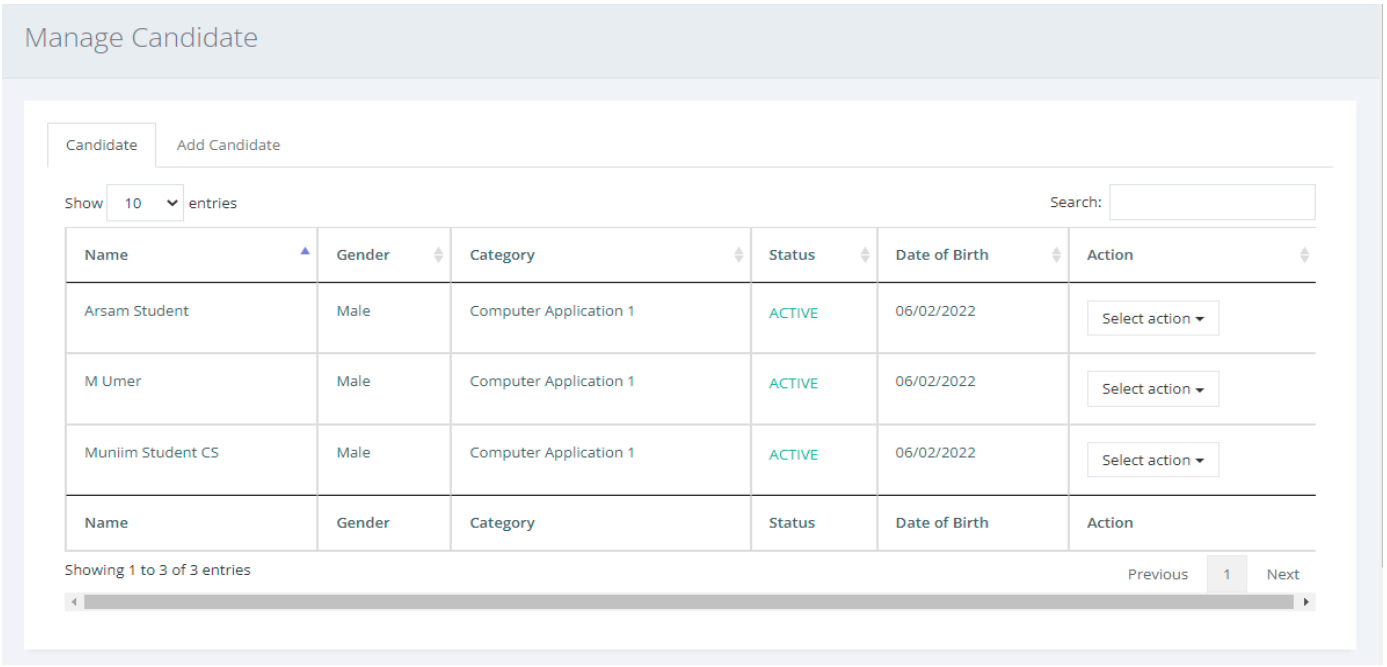
The Screenshot 29 illustrates that teacher can send invite to the students for joining the subject.



Screenshots 29: Invitation Pane

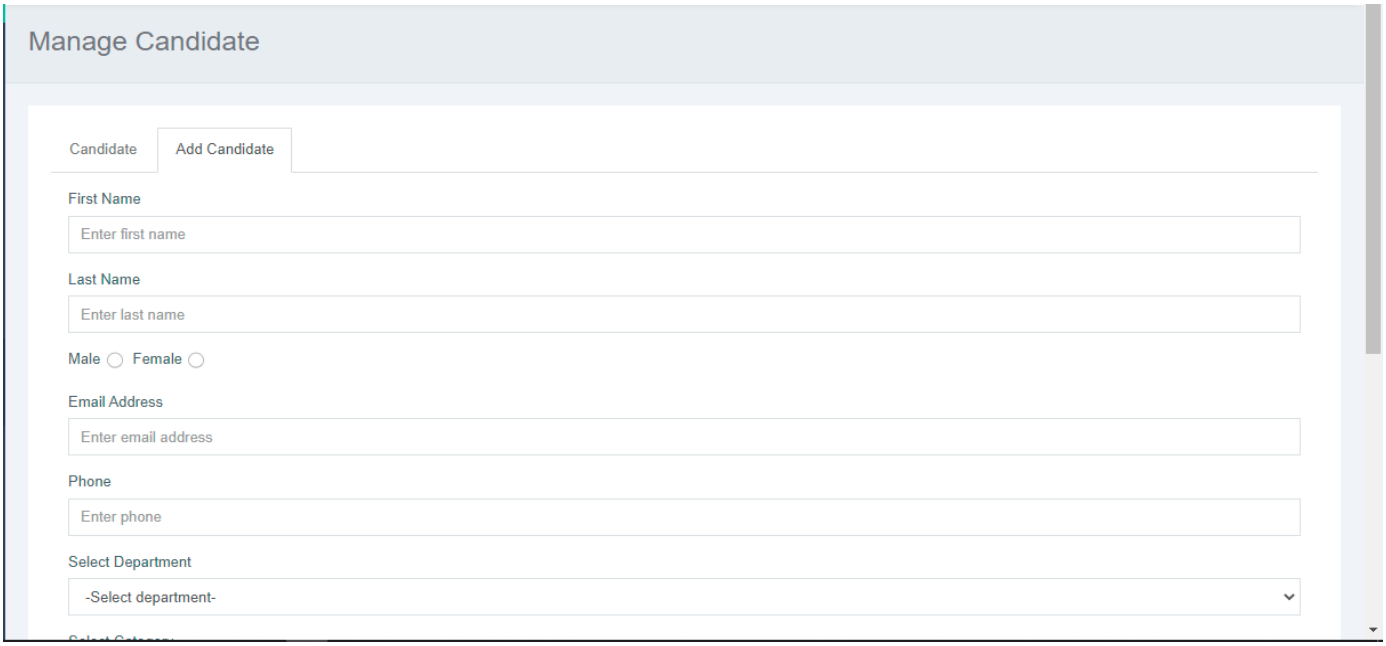
5.3.5. Candidate

The Screenshot 30 illustrates the overall students in the teacher's class reading a particular subject



Screenshots 30: Overall Students

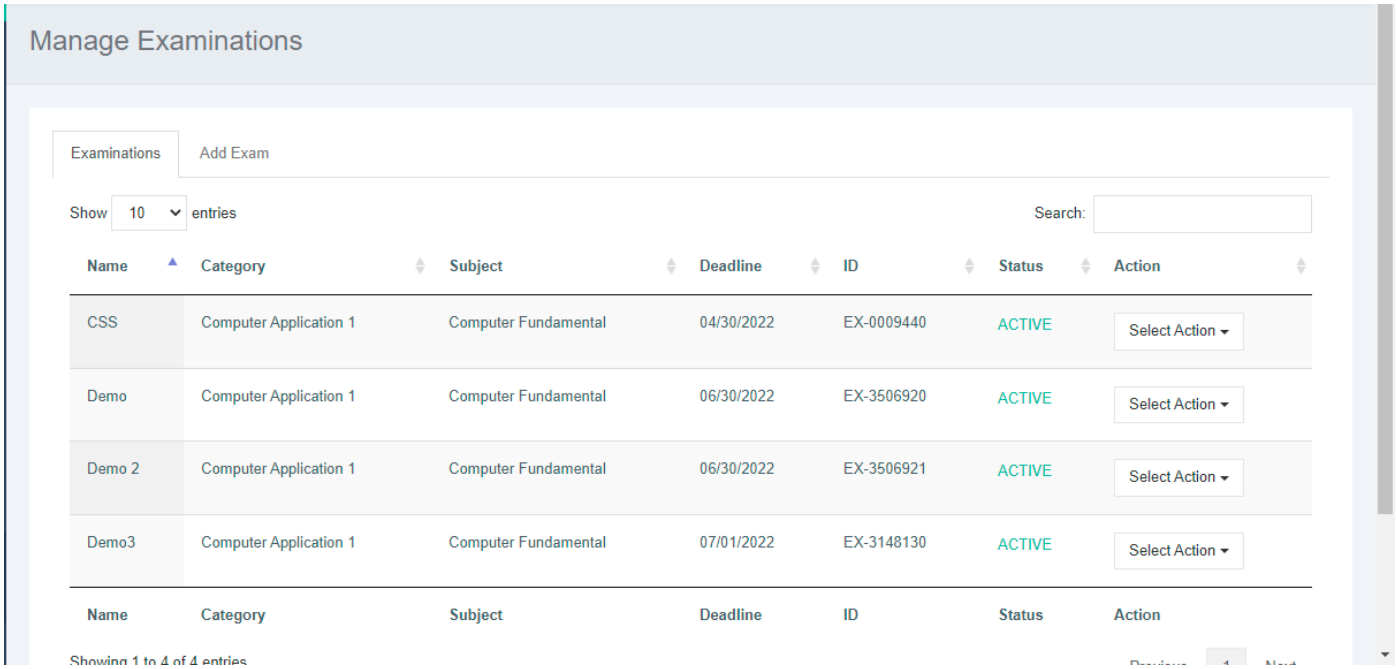
The Screenshot 31 illustrates that teacher too can add students which directly goes into the database of the system.



Screenshots 31: Add Students

5.3.6. Examination

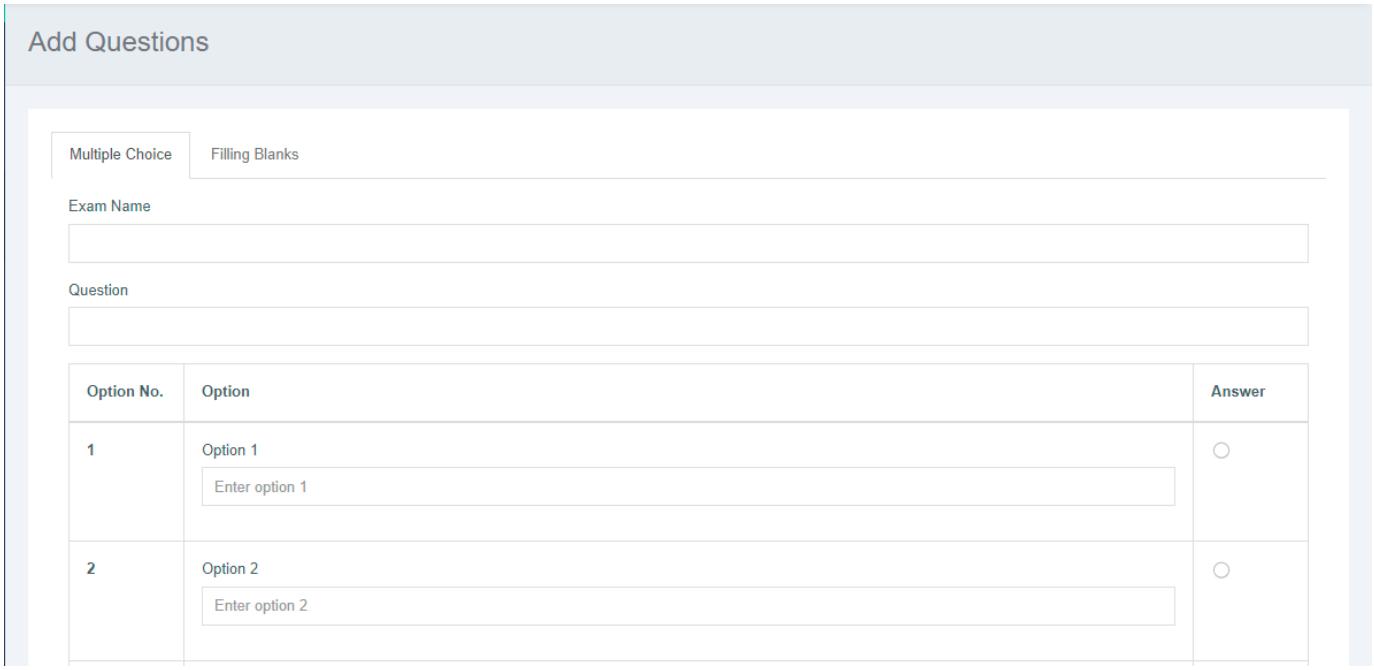
The Screenshot 32 illustrates the overall exam that is being conducted.



Screenshots 32: Overall On-Going Exams

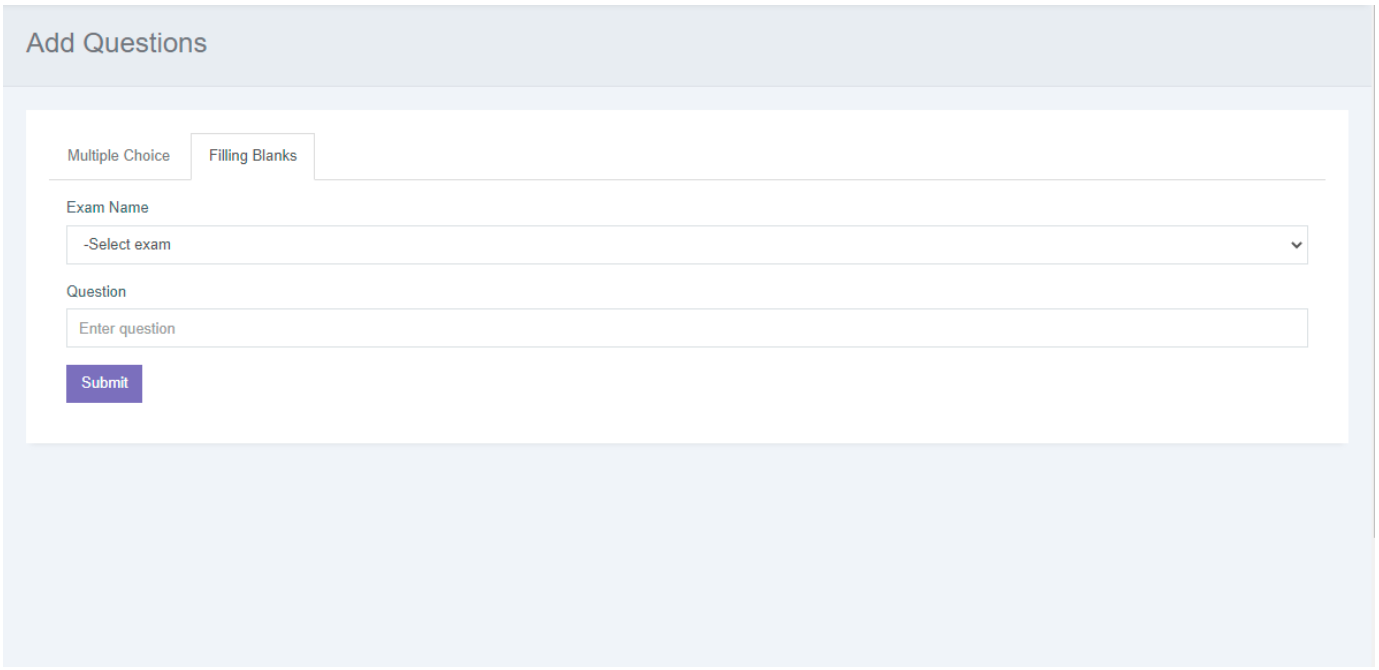
5.3.7. Questions

The Screenshot 33 illustrates that teacher is making an exam of MCQS based. In which he first adds the question followed by the options.



Screenshots 33: Exam Creation (MCQS)

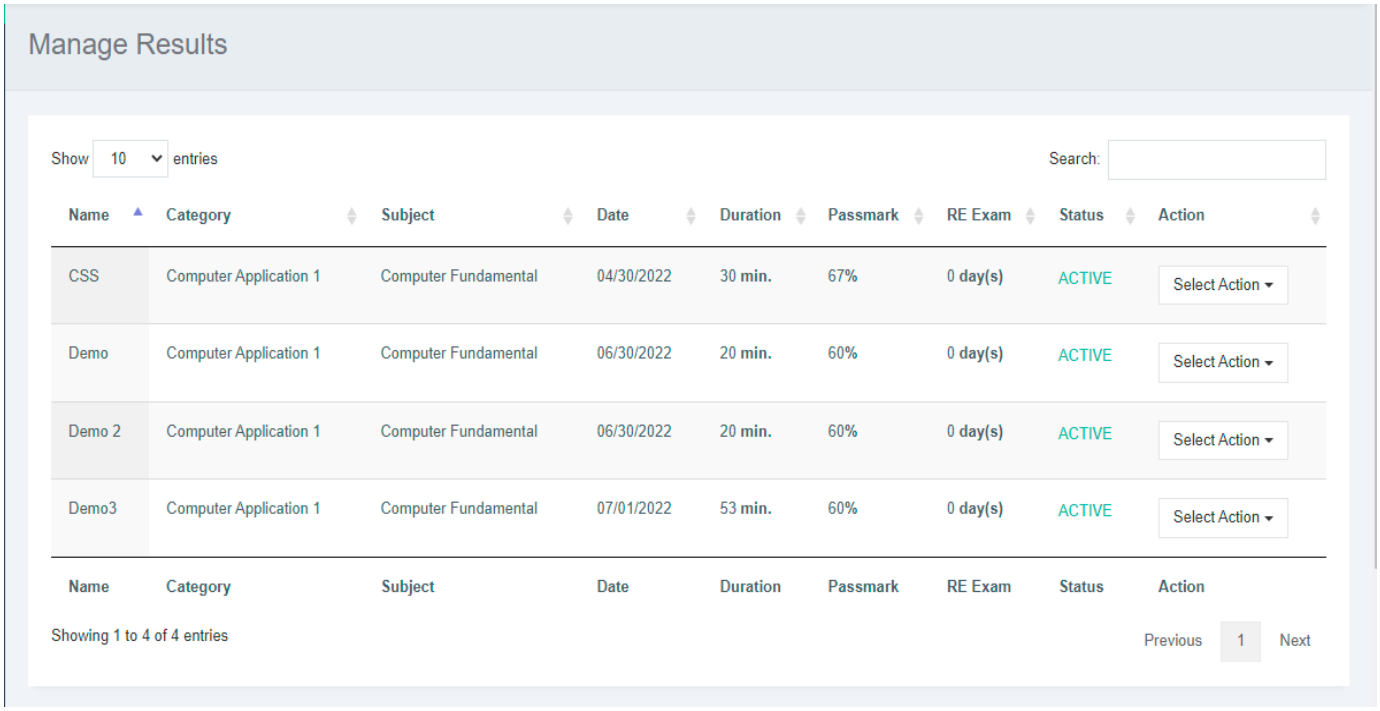
The Screenshot 34 illustrates that teacher is making an exam of filling in the blanks type



Screenshots 34: Exam Creation (S/Q

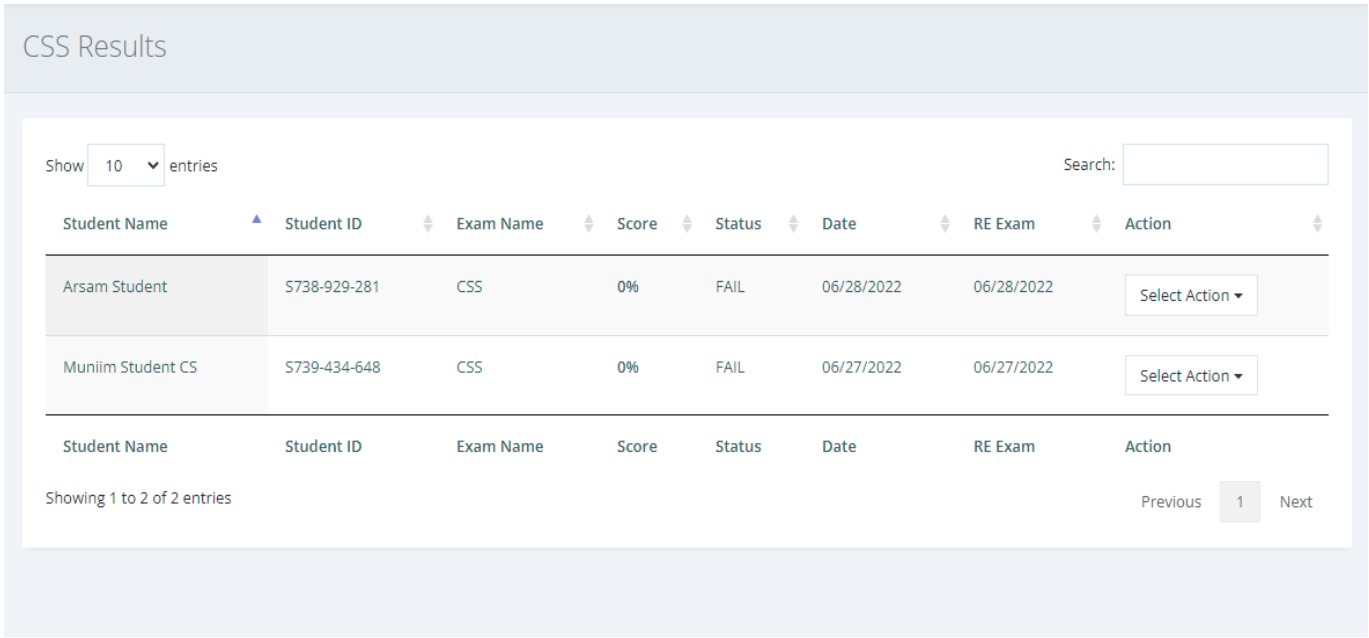
5.3.8. Exam Result

The Screenshot 35 illustrates the overall exam result of various subjects.



Screenshots 35: Exams Status

The Screenshot 36 illustrates the result of a particular subject.



Screenshots 36: Overall Student Result

Chapter No
6

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6. References

6.1. References

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