ONLINE LEARNING AND EXAM SYSTEM

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This Report Presented in Partial Fulfillment of the Requirements for
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December, 2017

APPROVAL

This Project titled **"ONLINE LEARNING AND EXAM SYSTEM"**, submitted by Golam Rabbany, ID No: 133-15-2851 and Mamun Or Rashid, ID No: 141-15-3389 to the Department of Computer Science and Engineering, Daffodil International University, has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of B.Sc. in Computer Science and Engineering and approved as to its style and contents. The presentation has been held on 26-12-2017.

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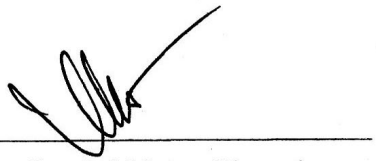

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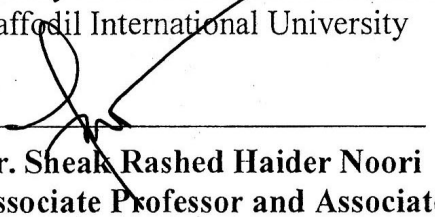

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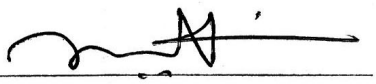

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We hereby declare that, this project has been done by us under the supervision of **Ms. Rifat Ara Shams, Assistant Professor, Department of CSE,** Daffodil International University. We also declare that neither this project nor any part of this project has been submitted elsewhere for award of any degree or diploma.

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ACKNOWLEDGEMENT

First we express our heartiest thanks and gratefulness to almighty Allah for His divine blessing makes us possible to complete the final year project successfully.

We really grateful and wish our profound our indebtedness to **Ms. Rifat Ara Shams, Assistant Professor**, Department of Computer Science and Engineering, Daffodil International University, Dhaka. Deep Knowledge & keen interest of our supervisor in the field of web development influenced us to carry out this project. His endless patience, scholarly guidance, continual encouragement, constant and energetic supervision, constructive criticism, valuable advice, reading many inferior draft and correcting them at all stage have made it possible to complete this project.

We would like to express our heartiest gratitude to **Dr. Syed Akhter Hossain,Professor and Head,** Department of Computer Science and Engineering, for his kind help to finish our project and also to other faculty member and the staff of Computer Science and Engineering department of Daffodil International University.

We would like to thank our entire course mate in Daffodil International University, who took part in this discuss while completing the course work.

Finally, we must acknowledge with due respect the constant support and patients of our parents.

ABSTRACT

The main purpose of the **"Online Learning and Exam System"** is to make a better solution for academic Students and Education Board. This application is very essential for an academic Students and Education Board. Education Board handle the examinations and student results and for academic Students to handle their online learning and gain online academic certificates. It is also very useful for any students to test himself continuously for their Analytical development in Science field and for Education Board to make progress in their digitization work by getting online analytical exam from the PEC, JSC, SSC, HSC Examinee. This system provides various types learning facts(gaming puzzle , video tutorial for specific academic Subject) and various types of questions (MCQ, single textbox, mixture of both type, image in questions, Scenario based) with time duration and calculate instant exam results which saves the precious time of Students and teachers . Education Board to check the mental ability of students in ICT or different Subject of Science using this online Board Exam.To develop this web application we used Code Igniter (MVC framework for PHP), which helps us to build this application faster. We also used HTML, CSS, Bootstrap, jQuery and JavaScript for better web design and make this application user friendly. After implementation of all functions, the system is tested in different stages and it works successfully as a prototype.

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CHAPTER 1

Introduction

Online learning and Exam System is a web application that establishes a network among the institutes and the students and the Board of Examination.

1.1 Online Exam

Learning can learn from this system it provides various types of learning facts gaming puzzle, video tutorial for specific academic subjects.

1.2 Online Learning

In the case of survey system the scenario is a bit different. In this case usually researchers create survey questions they want in the survey. These survey questions are displayed to the particular users. The answers enter by the users are then evaluated and their score is calculated and published by graph. This score then can be accessed by the researchers and users to see survey result.

1.3 Contexts

Online Learning and Exam System provides the platform but does not directly participate in, nor is it involved in any exam conducted. Questions are posted not by the site, but Teachers or education board of the site. For exam system the site requires an institute to register before posting the questions.

The site has an administrator who keeps an eye on the overall functioning of the system. The site gives totally free services to the institutes and education board each time they want to conduct the exam students can learn from subjective video tutorials which are provided by administration. The system entitled **"**Online Learning and Exam System**"** is an application software, which aims at providing services to the institute'sstudents and providing them with an option of selecting the particular students and or users by themselves. It is developed by using HTML, CSS, Bootstrap, JavaScript, jQuery, PHP framework CodeIgniter and MySQL database [1][2][3].

1.4 Existing Systems and their Limitations

The current systems on exams and surveys are very ancient and need to be replaced as it is an increasing demand by the academic institutes and also by the education board.

One of the biggest disadvantages of the current exam system is the lacking of online exam system. Due to this reason a student got to waste their time by visiting notice board again and again or may be by visiting department office/faculty chamber. Besides, students need to attend in exam hall physically and at the same time lots of Exam schedule and manual work is required to be done in the office.

For the traditional learning system one of the biggest disadvantages is that lacking of online learning system**.**This is very time consuming and hardworking process.

Some the online learning and exam applications are available on the internet but those are not totally free of cost and dynamic. After creating limited times of quiz or learning users need to pay for the application. Our proposed application is totally free and can be used unlimited times for exam learning and certificates. Teachers also can reuse the question which they created previously by changing the schedule and the question.

1.5 Objectives of this Project

Objectives of our web application are mentioned bellows:

- To facilitate educational institute to create course wise exam.
- To provide a platform for teachers to evaluate their students using this exam system.
- To provide an opportunity to the teachers to reuse their questions.
- To provide learning opportunity to the students from different (Lecturers OR professors) Trades.
- Education Board can check the analytical Ability of the Board Examine using this Application.
- To provide opportunity to collect data using our web application.

CHAPTER 2

Methodology

In software engineering methodology is a framework that is used to control the structure, plan and process of a developing system. It is also known as software development life cycle. In life cycle software development work divided into some stages containing activities with the intent of better planning and management.

2.1 Software Process Model

To solve an actual problems, software developers must incorporate a development strategy that encompasses the process, methods and tools layers and generic phases. This strategy is often referred to as process model or a software developing paradigm. A process model for software developing is chosen based on the nature of project and application, the methods and tools to be used, and the controls and deliverables that are required. All software development can be characterized as a problem solving loop in which four distinct stages are encountered, Status quo, Problem definition, technical development and solution integration. Regardless of the process model that is chosen for a software project all of the stages co-exist simultaneously at some level of details. In software engineering there are several types of life cycle model. For our application we worked on the basis of Agile life cycle model [4][5][6].

2.2 Agile Model

The Agile model is a popular version of the systems development life cycle model for its linear sequential criteria which means each phase must have to be totally completed before the next phase has start. At the end of every phases a review was taken to determine the project is on the right path [7][8][9].

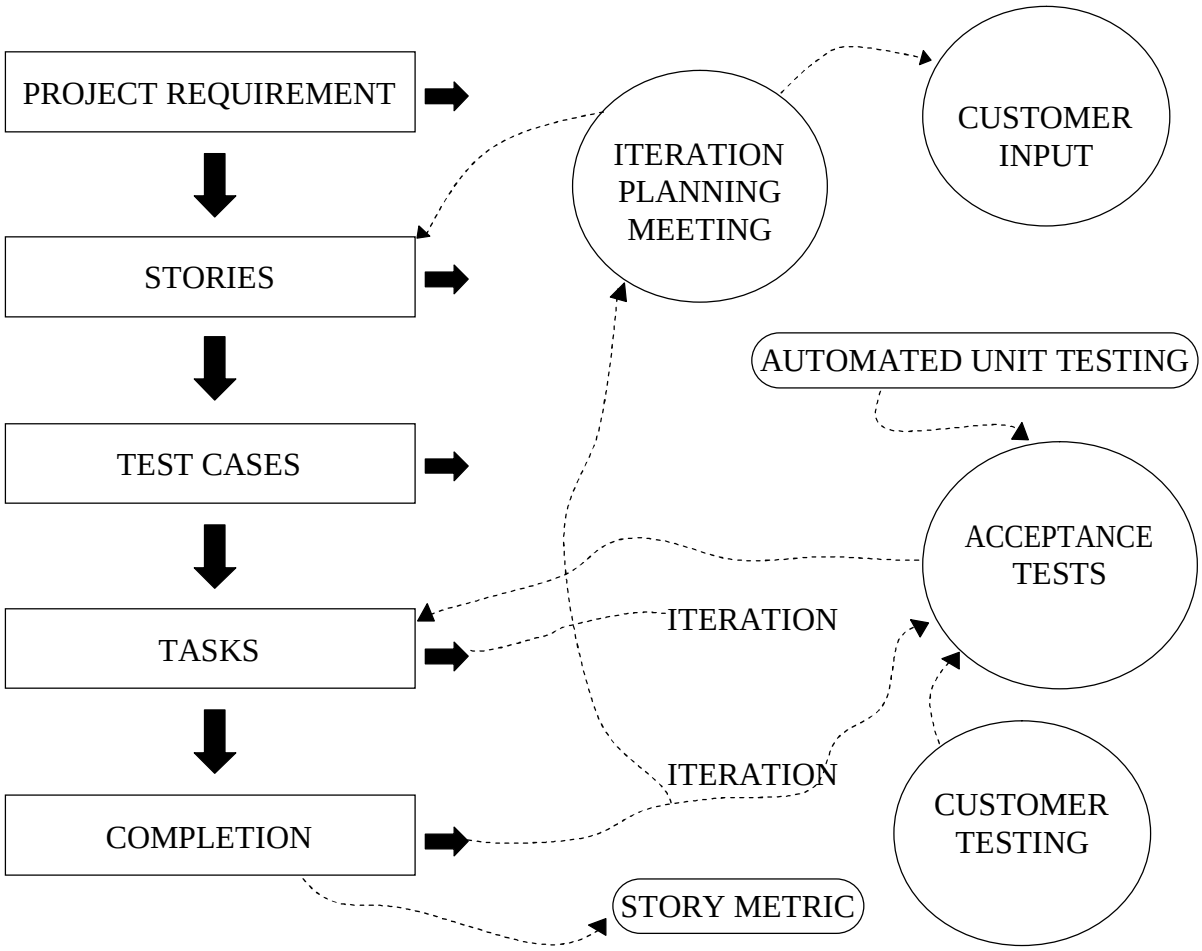

Figure 2.1**:** Agile Model

2.2.1 Requirements

Requirements analysis is the process of determining user expectations for a new or modified product. Requirements analysis must be quantifiable, relevant and detailed. In software engineering, such requirements are often called functional specifications. Requirements analysis is an important aspect of project management. Requirements analysis involves frequent communication with system users to determine specific feature expectations, resolution of conflict or ambiguity in requirements as demanded by the various users or groups of users.

2.2.2 Design

Software design is creating a specification of a software artifact is to accomplish the goal. A design pattern is a general reusable solution to a commonly occurring problem in software design. A design pattern is not a finished design that can be transformed directly into code. In this section we will work for how to solve a problem that can be used in many different situations.

2.2.3 Implementation

Implementationis the realization of an application or execution of aplan, idea,model,design,specification,standard,algorithm, or policy. Incomputer science, an implementation is a realization of atechnical specificationor algorithm as aprogram,software component. Many implementations may exist for a given specification or standard.

2.2.4 Verification

Verification is the process of evaluating a system or its components with the intent to find whether it satisfies the specified requirements or not. Testing is executing a system in order to identify errors or other defects and missing requirements in contrary to the actual requirements. Software verification methods are traditionally divided into white and black box testing.

2.2.5 Maintenance

Software maintenance in software engineering is the modification of a software product after delivery to correct faults, to improve performance or other attributes. A common perception of maintenance is that it merely involves fixing defects.

2.3 Reason to Choose

- It lays focus on customer involvement
- Establishes rational plans and schedules
- Developers are exceptionally committed to the project
- Equipped with modernistic methods for quality software

2.4 Developing Tools

Our application is developed by CodeIgniter which is MVC framework for PHP**.** We also used HTML, CSS, Bootstrap, jQuery and JavaScript for better responsive web design and make this application user friendly.

2.4.1 Codelgniter

CodeIgniter is an application development framework, which can be used to develop websites, using PHP. It is an Open Source framework. It has a very rich set of functionality, which will increase the speed of website development work. CodeIgniter is loosely based on the popular model view controller development pattern. While controller classes are a necessary part of development under CodeIgniter, models and views are optional. Codeigniter can be also modified to use Hierarchical Model View Controller which allows developers to maintain modular grouping of Controller.

2.4.2 CodeIgniter Application Flow Chart

The following graphic illustrates how data flows throughout the system:

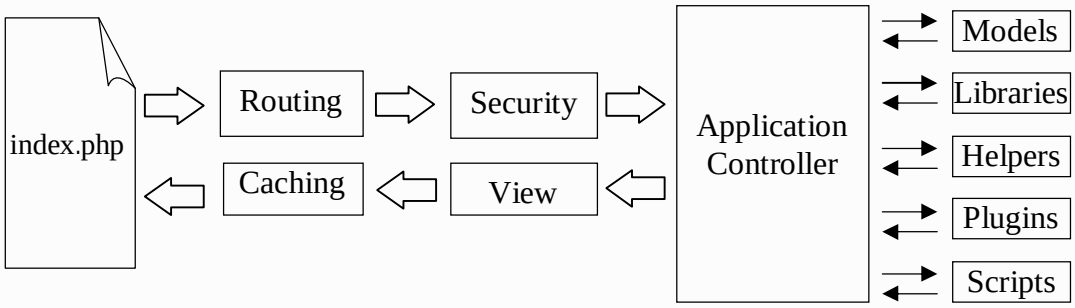

Figure 2.2**:** Codelgniter Application Flow Chart

- The index.php serves as the front controller, initializing the base resources needed to run CodeIgniter.
- The Router examines the HTTP request to determine what should be done with it.
- If a cache file exists, it is sent directly to the browser, bypassing the normal system execution.

- Security. Before the application controller is loaded, the HTTP request and any user submitted data is filtered for security.
- The Controller loads the model, core libraries, helpers, and any other resources needed to process the specific request.
- The finalized View is rendered then sent to the web browser to be seen. If caching is enabled, the view is cached first so that on subsequent requests it can be served [10][11].

CHAPTER 3

Feasibility Study

The feasibility study of any system is mainly intended to study and analyze the proposed system and to decide whether the system under consideration will be viable or not after implementation. That is it determines the usability of the project after deployment. To come to result a set of query is answered keeping the efficiency of the software and its impact on the domain for which it was developed. It main emphasis is on the following three questions elucidated below as:

- What are the user's requirements and how does a candidate system meet them?
- What resources are available for the proposed systems? Is it worth solving the problem?
- What is the likely impact of the proposed system on the organization? I.e. how does the proposed system fit within the organization?

Thus since the feasibility study may lead to commitment of large resources, it becomes necessary that it should be conducted competently and no fundamental errors of judgment are made. Different types of feasibility study and the way we performed on our project "Online Exam and Survey System".

3.1 Technical Feasibility

Technical feasibility centers on the existing manual system of the test management process and to what extent it can support the system. According to feasibility analysis procedure the technical feasibility of the system is analyzed and the technical requirements such as software facilities, procedure, inputs are identified. It is also one of the important phases of the system development activities. The system offers greater levels of user friendliness combined with greater processing speed. Therefore, the cost of maintenance can be reduced. Since, processing speed is very high and the work is reduced in the maintenance point of view management convince that

the project is operationally feasible [12][13][14].

3.2 Economic Feasibility

Economic analysis is most frequently used for evaluation of the effectiveness of the system. More commonly known as cost/benefit analysis the procedure is to determine the benefit and saving that are expected from asystem and compare them with costs, decisions is made to design and implement the system. This part of feasibility study gives the top management the economic justification for the new system. This is an important input to the management, because very often the top management does not like to get confounded by the various technicalities that bound to be associated with a project of this kind. A simple economic analysis that gives the actual comparison of costs and benefits is much more meaningful in such cases. In the system, the organization is most satisfied by economic feasibility. Because, if the organization implements this system, it need not require any additional hardware resources as well as it will be saving lot of time [15][16][17][18].

CHAPTER 4

System Design

Systems design is the process of defining the architecture, components, modules, interfaces, and data for a system to satisfy specified requirements. In this chapter overall system design of our application has been showed, where architectural design, use case diagram, flow chart and data flow diagram is included [19].

4.1 Architectural Design

Our application's architectural design shows that-

- User writes the web address of our application through the web browser.
- This link request goes to the web server.
- PHP Files fetch the data from database and the web page is showed to the user.
- PHP Files is written in CodeIgniter MVC framework following its pattern.

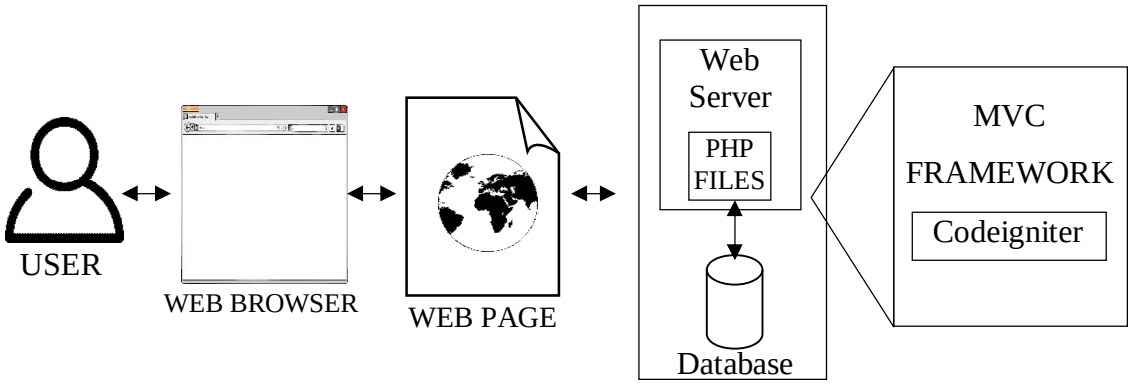

Figure 4.3: Architectural Design

4.2 Use Case Diagram

In use case diagrams the below figures shows that-

- Teacher, student, researcher and user is an actor.
- And the attributes are associated with actors.
- These attributes includes some sub-attributes.
- Particular actors are associated with particular attributes.
- Admin is associated with all the attributes.
- That is why he get all the features of this application.

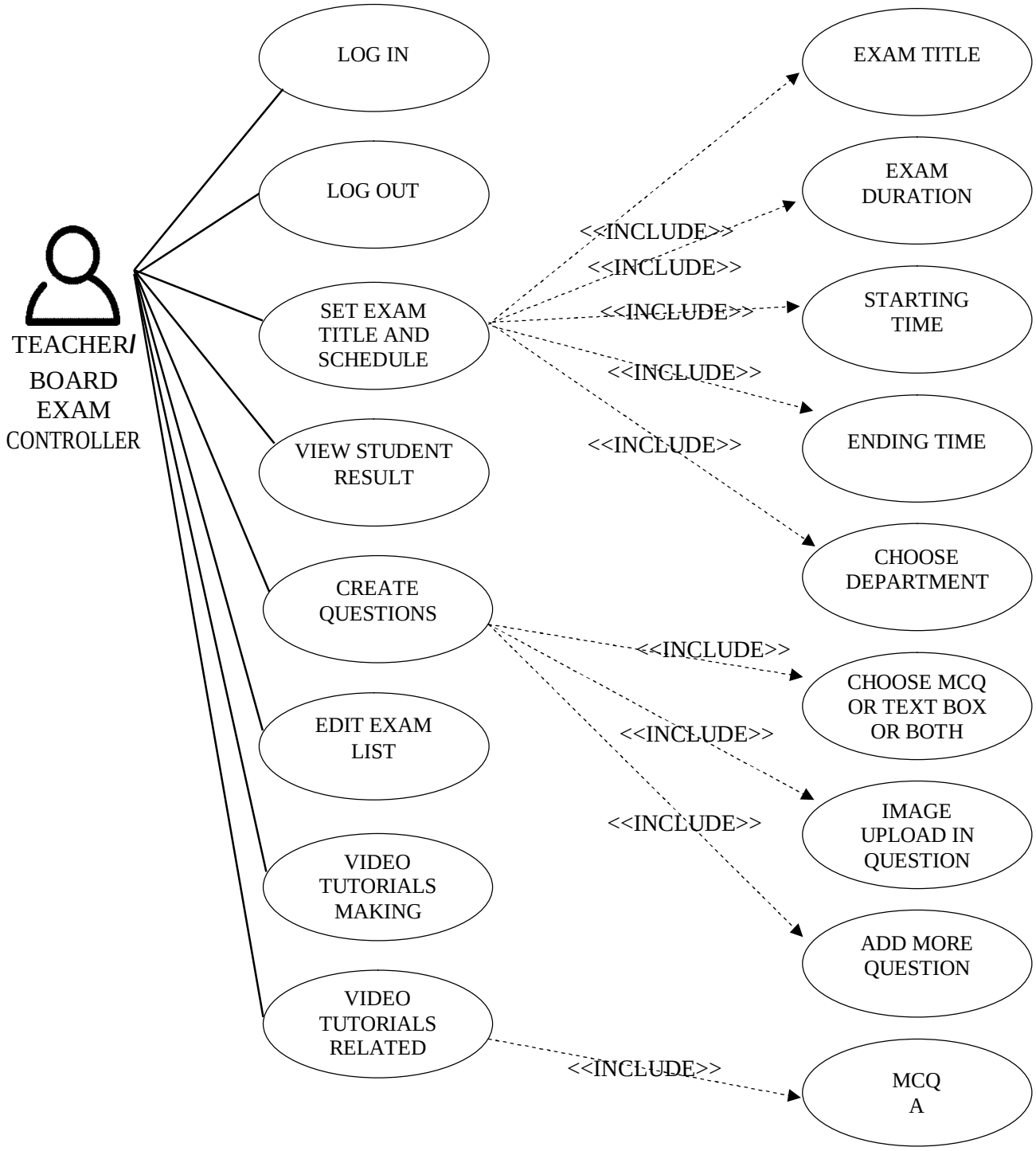

Figure 4.4: Use Case for Teacher

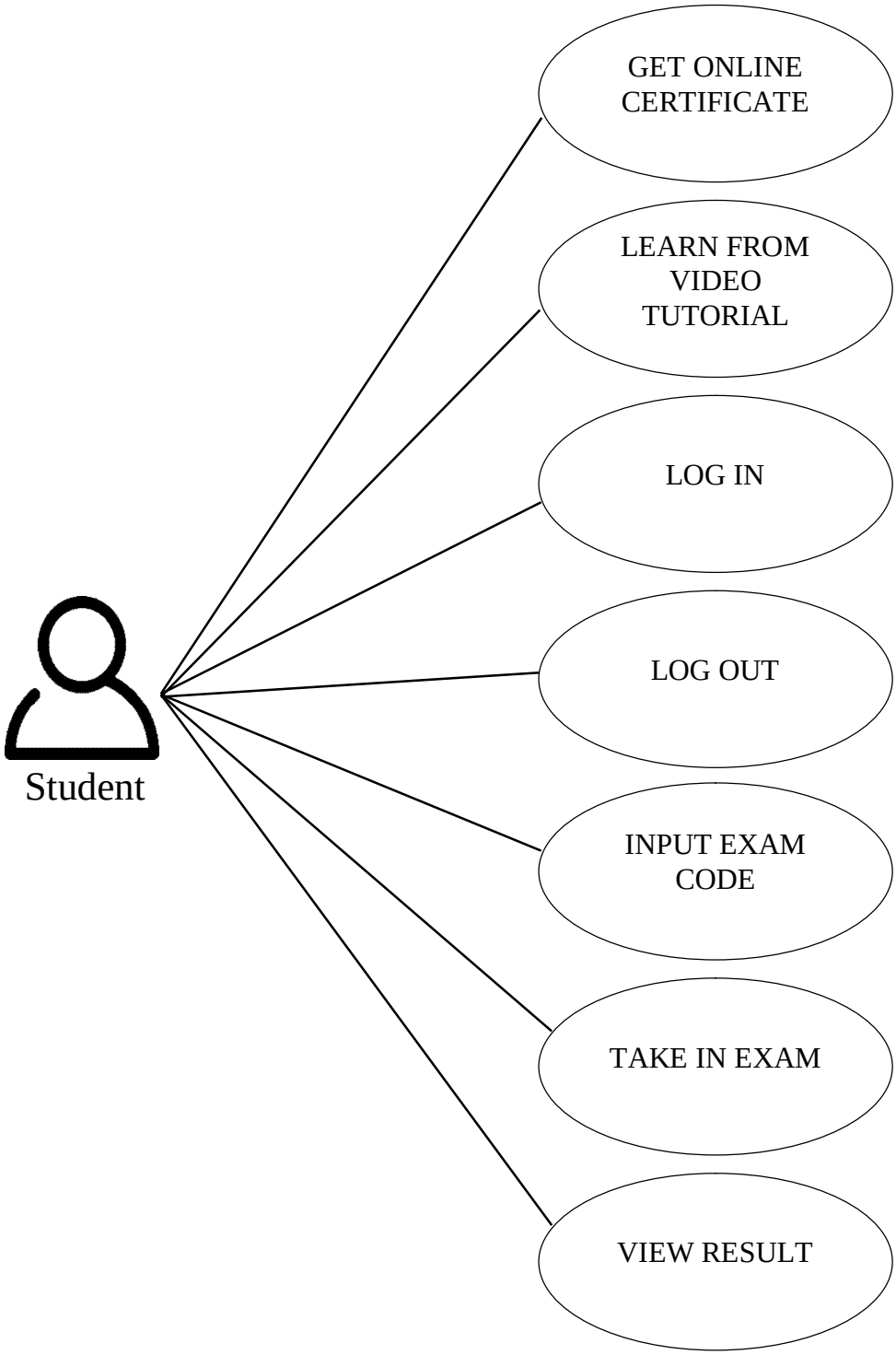

Figure 4.5**:** Use Case for student

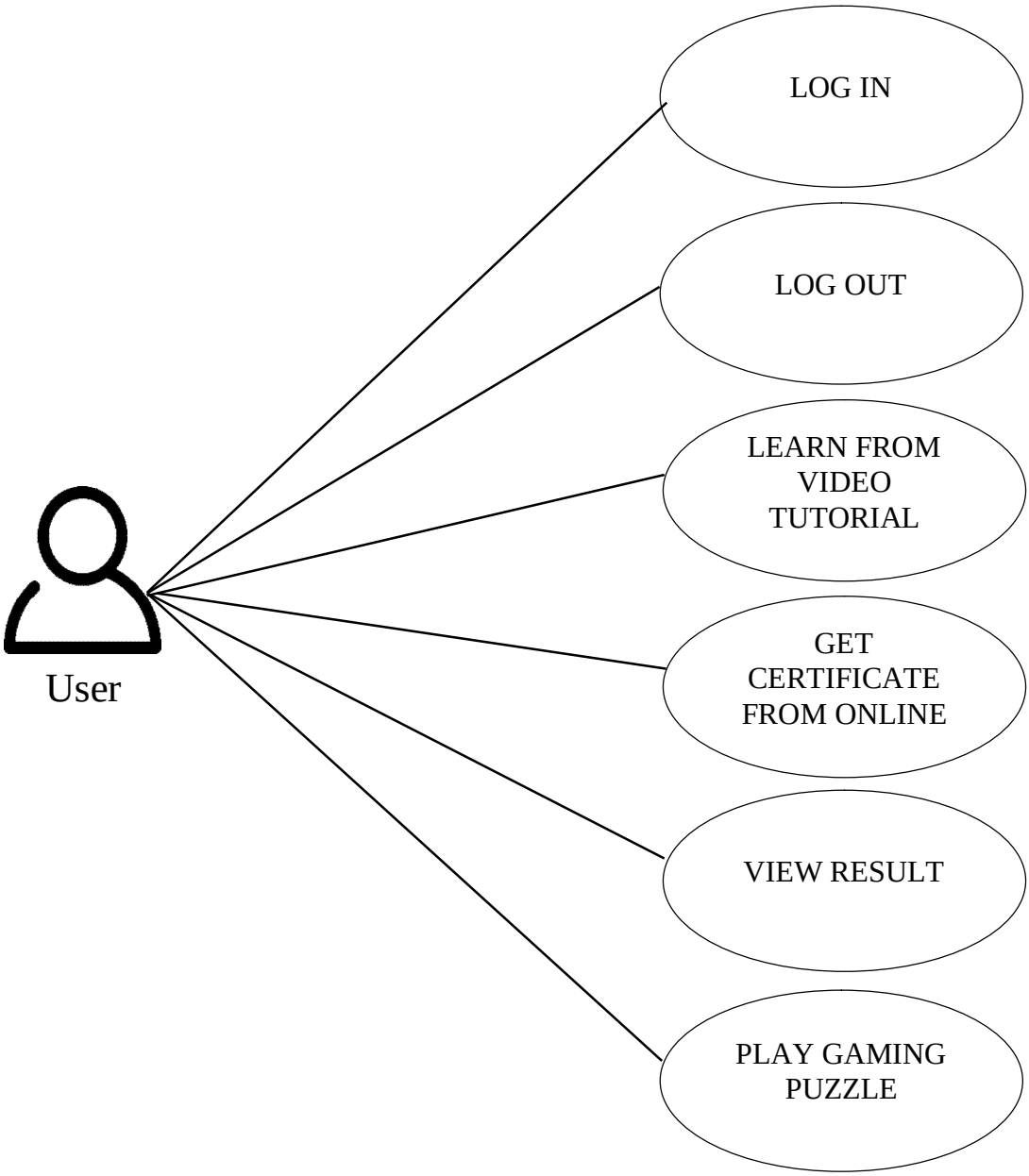

Figure 4.6**:** Use case for user

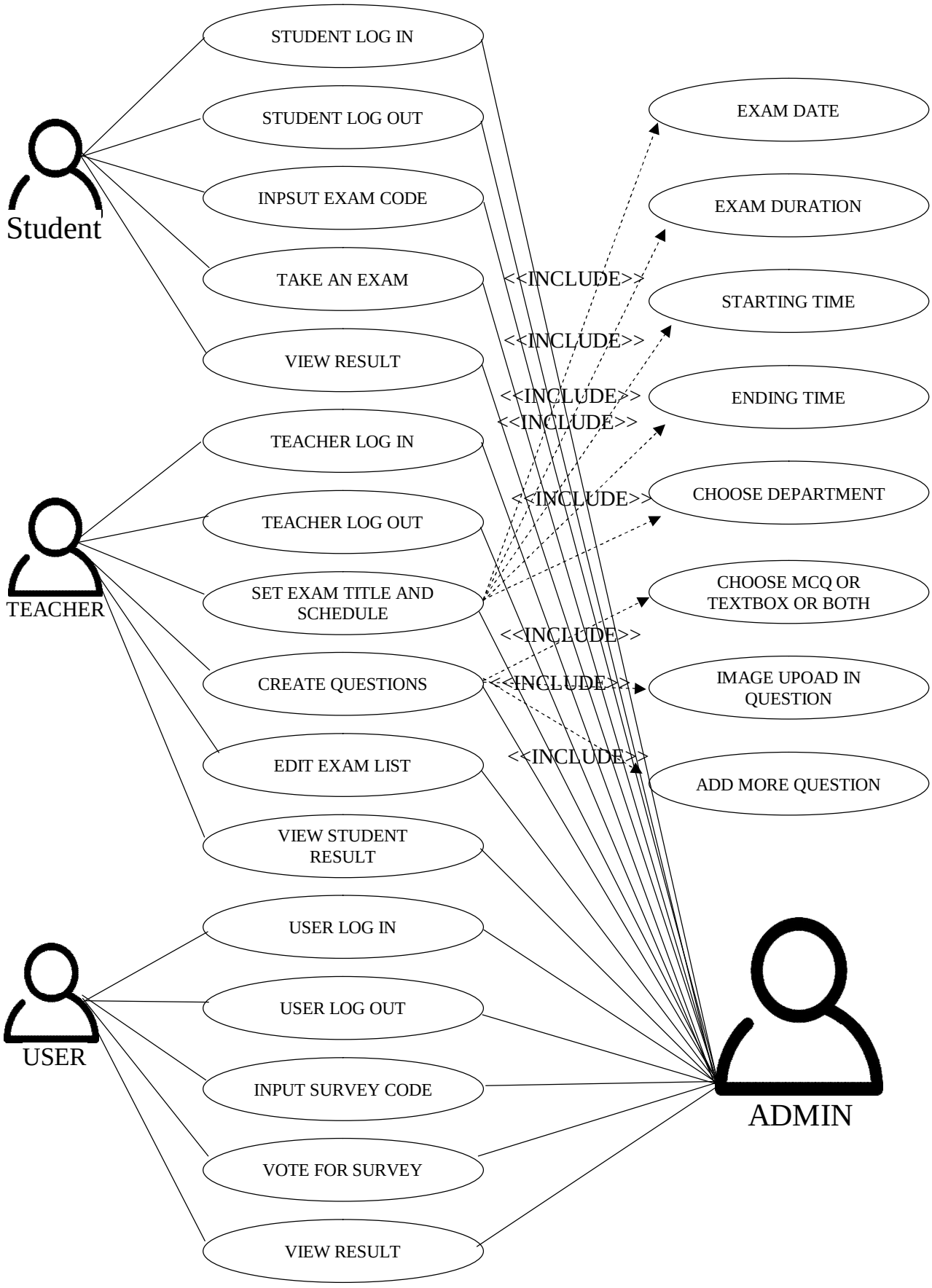

Figure 4. 7**:** Use case for Admin

4.3 Flow Chart

In flow chart the below figures navigates the flows of our application process.

In Exam System-

- Teacher or student start with this application.
- Either he logs in as teacher or student.
- If teacher's ID and password is correct he can create exam, distribute marks, view and edit exam list and view student result.
- And if his ID and password is not correct he goes back to the login.
- If student's ID and password is correct he can take participation in exam and view result.
- If not correct he goes back to the login.
- After doing this process if there is nothing to do, he can exit the application.

In Learning System-

- Student, Teacher OR Exam Board start with this application.
- Either he logs in as teacher or Student
- If teacher's ID and password is correct he can create video Tutorials, Video Tutorials Topics, Exams Question, Distribute Marks, and view student performance.
- And if his ID and password is not correct he goes back to the login.
- If student's ID and password is correct he can view result, Video Tutorials Topics, Exams Question, Get online certificate.
- If not correct he goes back to the login.
- After doing this process if there is nothing to do, he can exit the application

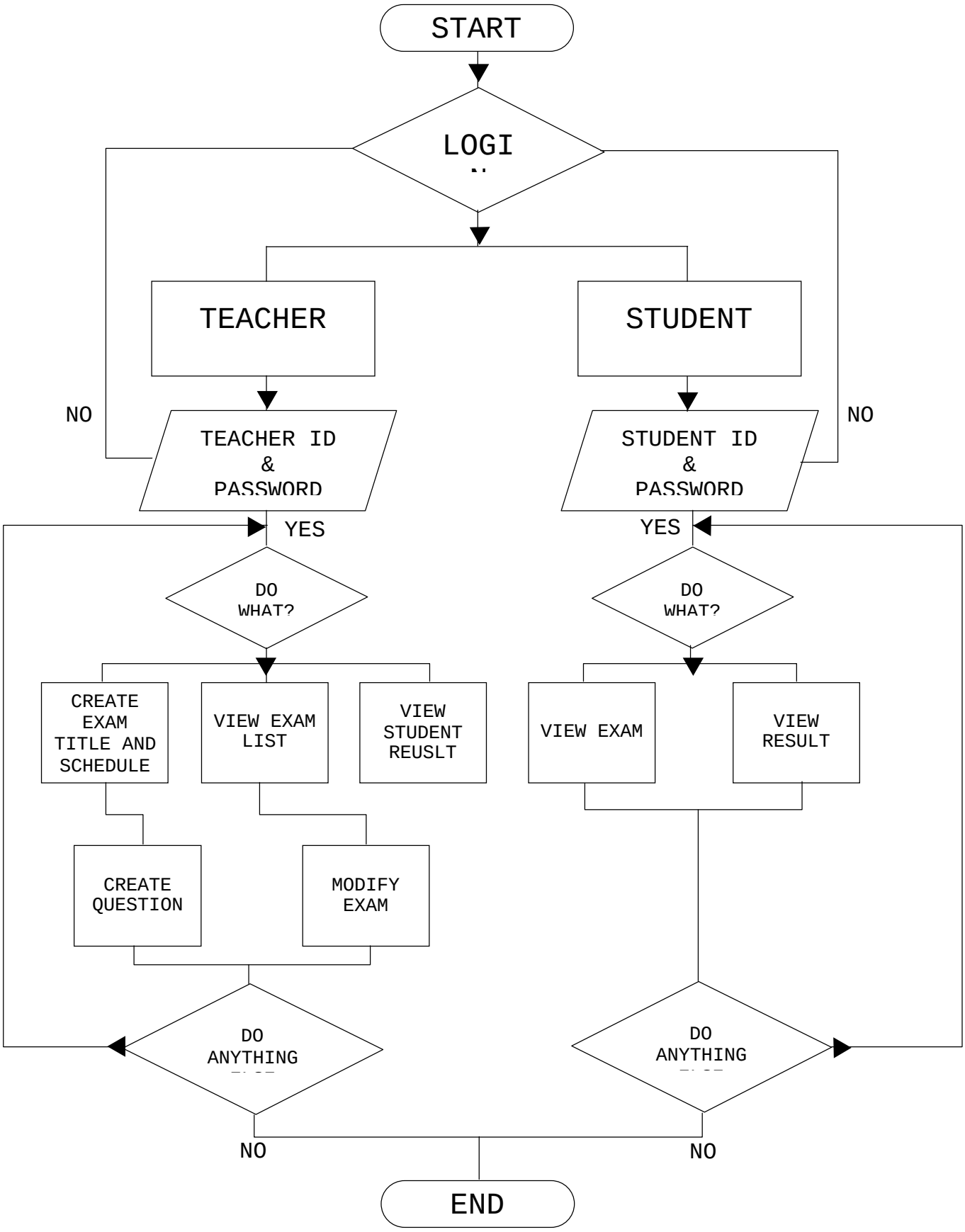

Figure 4. 8: Flow Chart for Exam System

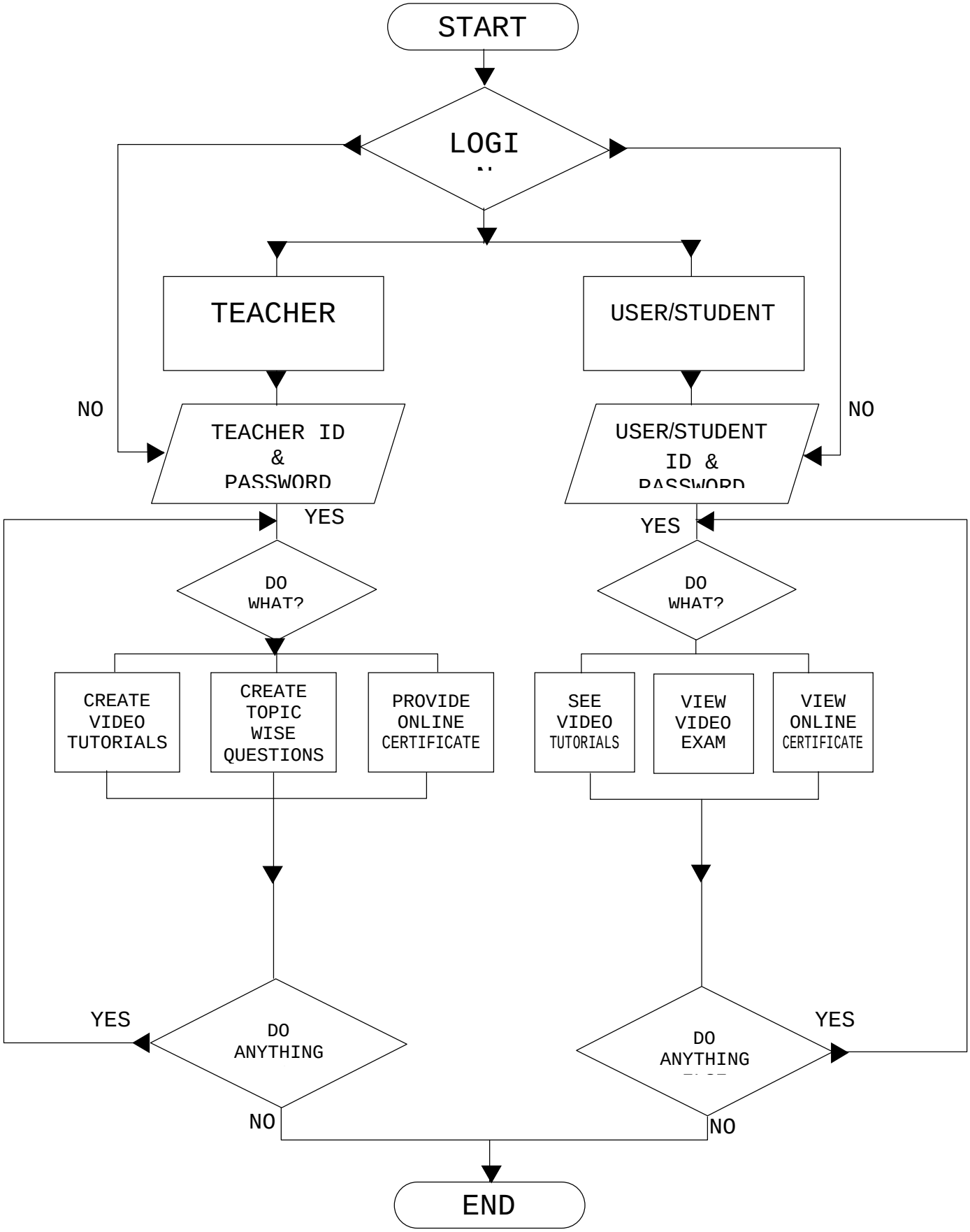

Figure 4. 9**:** Flow Chart for Learning System

4.4 Dataflow Diagram

Adata flow diagram(DFD) is a graphical representation of the "flow" of data through aninformation system, modelling itsprocessaspects. A DFD is often used as a preliminary step to create an overview of the system, which can later be elaborated.DFDs can also be used for the visualization of data processing (structured design).

The below DFD shows what kind of information will be input to and output from the system, where the data will come from and go to, and where the data will be stored.[20]

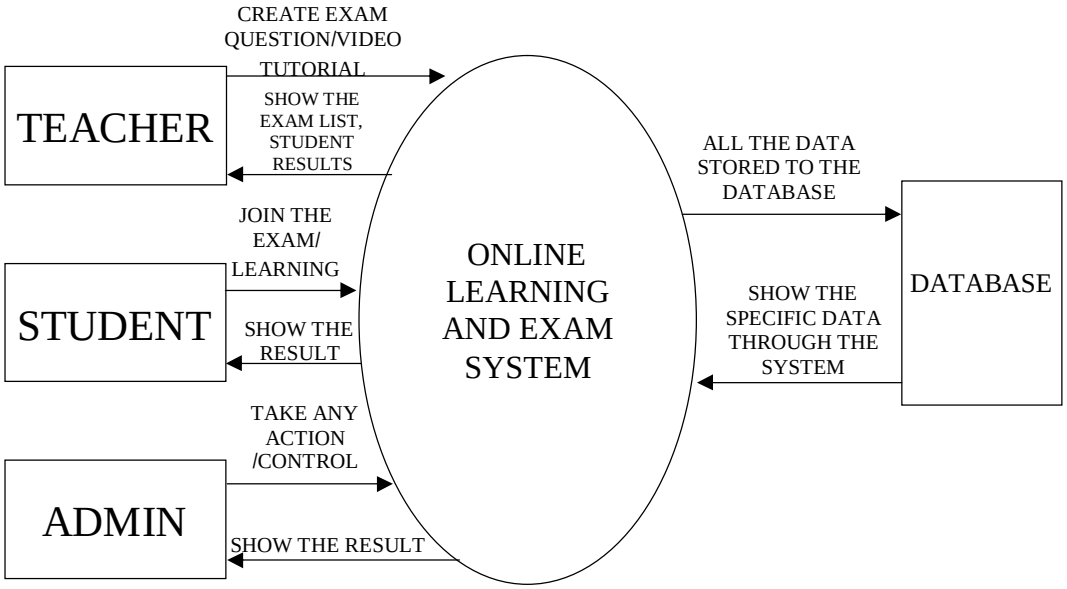

Figure 10**:** Data Flow Diagram

CHAPTER 5

Database Design

Database designis the process of producing a detaileddata modelofdatabase. This data modelcontains all the needed logical and physical design choices and physical storage parameters needed to generate a design in a data definition language, which can then be used to create a database. A fully attributed data model contains detailed attributes for each entity.

A database collects and stores data in such organized way that data requirements are satisfied by the database**.** The general objective is to make information access easy, quick, inexpensive and flexible for the user**.** There are also some specific objectives like controller redundancy from failure, privacy, security and performance**.** A collection of relative records makes up a table**.** To design and store data to the needed forms database tables are prepared**.** Two essential setting for a database are**:**

- Primary key:This field is unique for all the record occurrences**.**
- Foreign key:This field used to set relationship between tables**.** Normalization is a technique to avoid redundancy in the tables **[**21**].**

5.1 Database Management System

A database management system (DBMS) is system software for creating and managing databases. The DBMS provides users and programmers with a systematic way to create, retrieve, update and manage data. In our application we used MySQL [22].

5.2 MySQL

MySQL is the most popular open source relational SQL database management system. MySQL is one of the best RDBMS being used for developing web-based software applications. We are using MySQL as database in our proposed system. It's cos effective. There is no doubt that Oracle create terrific database but the cost involved will be prohibitive for many MySQL is free. It can be installed and used but pay nothing in the process [23].

5.3 Entity Relationship Diagram

An entity relationship diagram **(**ERD**)** is a data modeling technique that graphically illustrates an information systems' entities and the relationship between those entities**.** An ERD is conceptual and representational model of data used to represent the entity framework infrastructure **[**24**].**

The elements of an ERD are**:**

- Entities
- Relationship
- Attribute

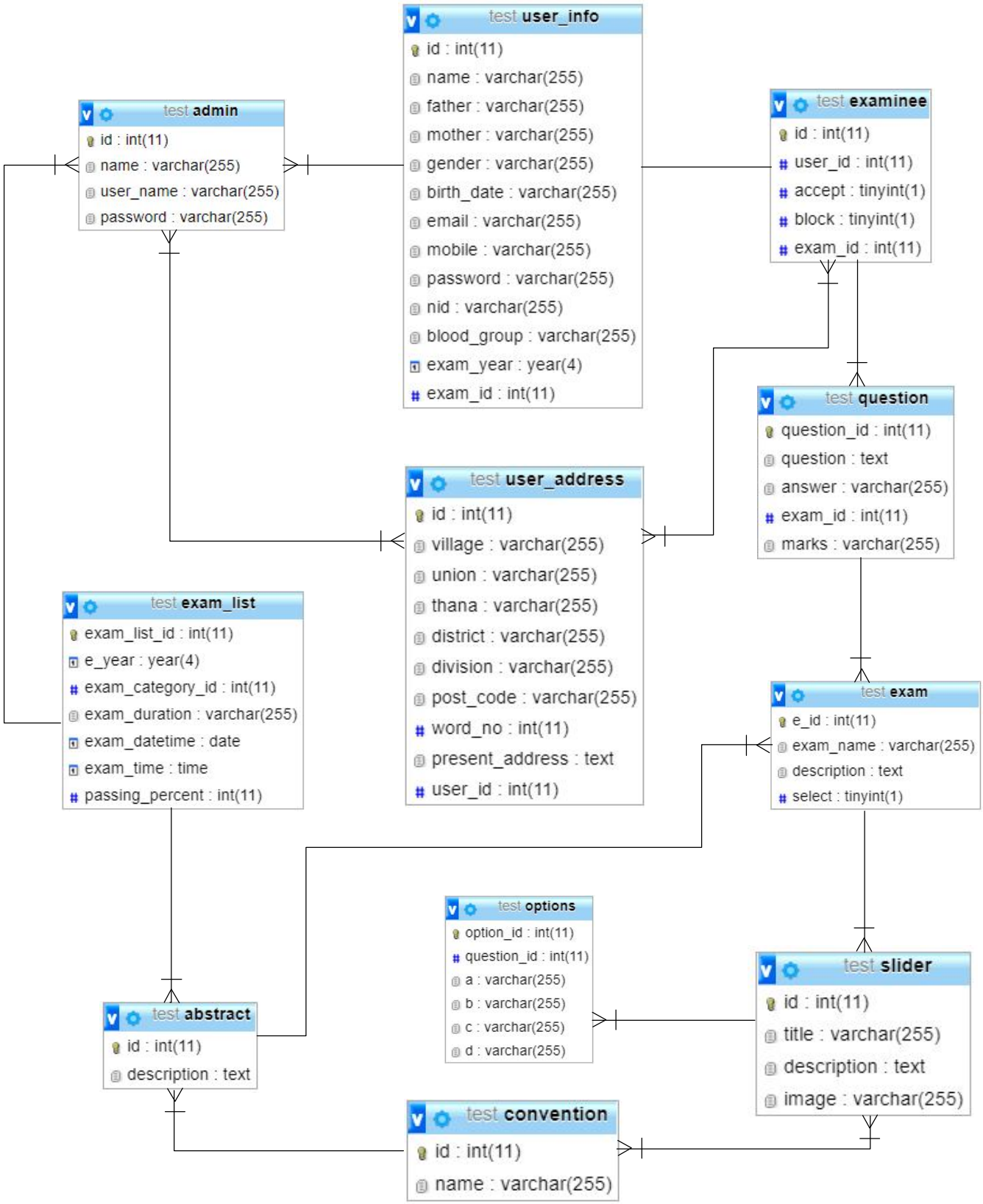

Figure 5. 11**:** Entity Relationship Diagram

5.4 Database Tables

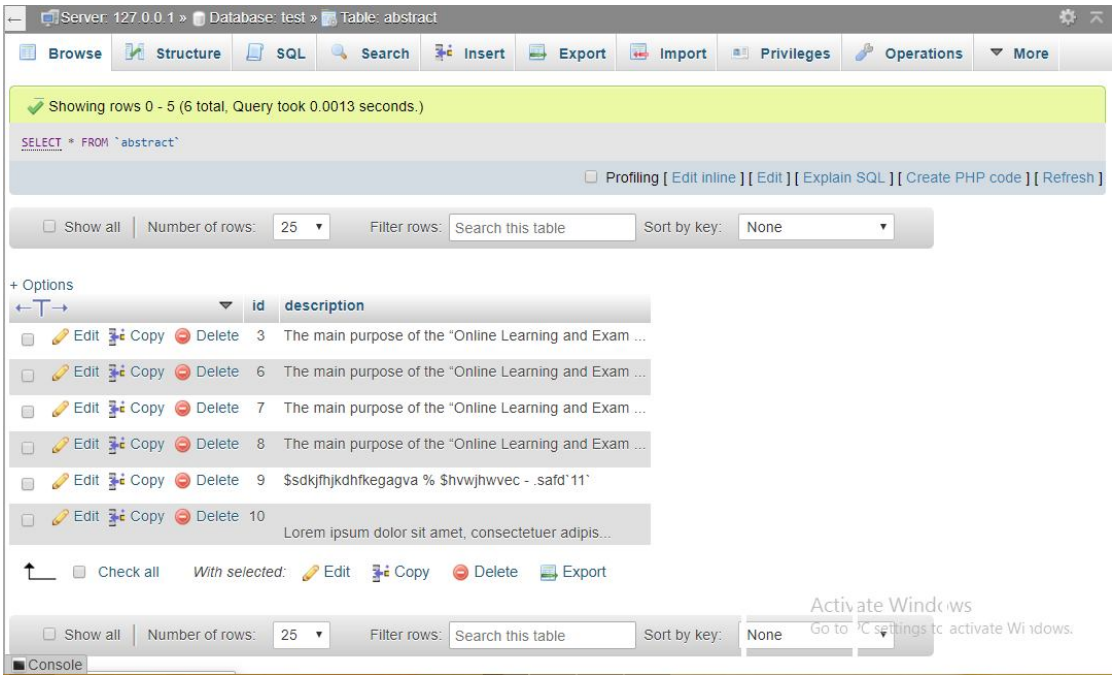

Figure 5. 12**:** Table for Abstract

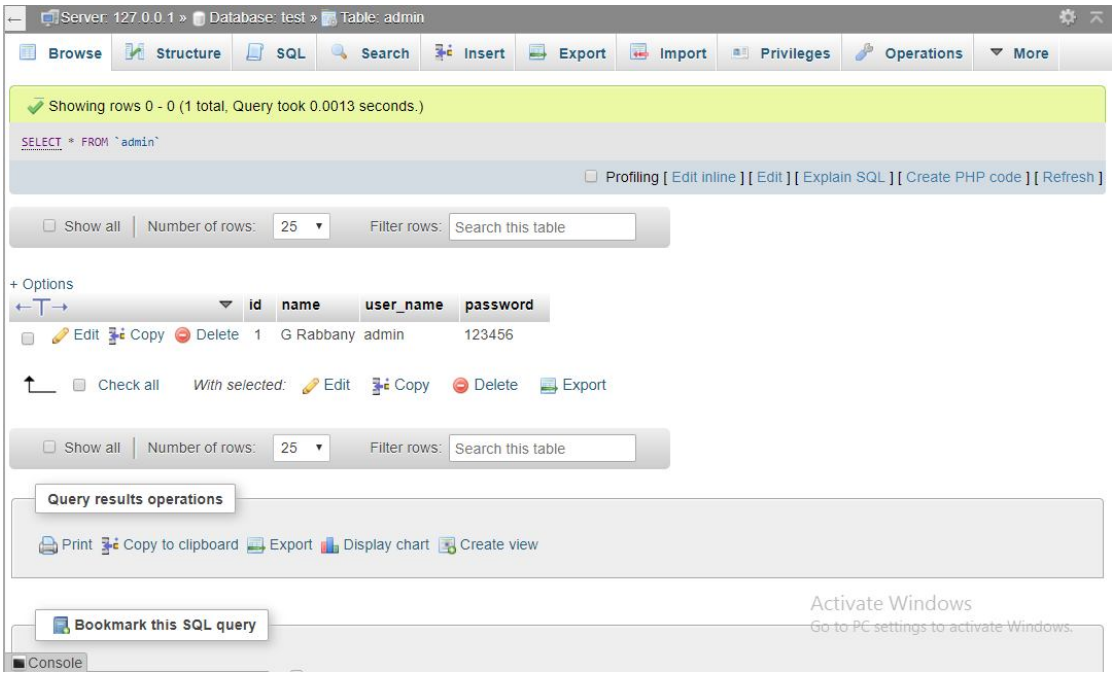

Figure 5. 13**:** Table for Admin

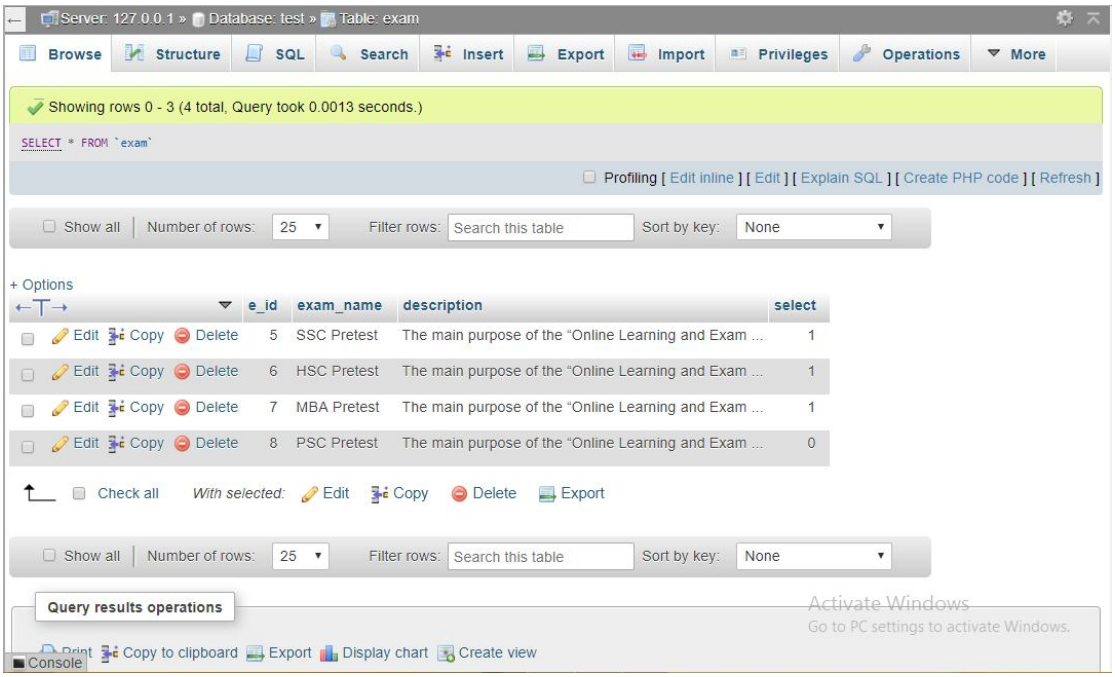

Figure 5. 154**:** Table for Exam

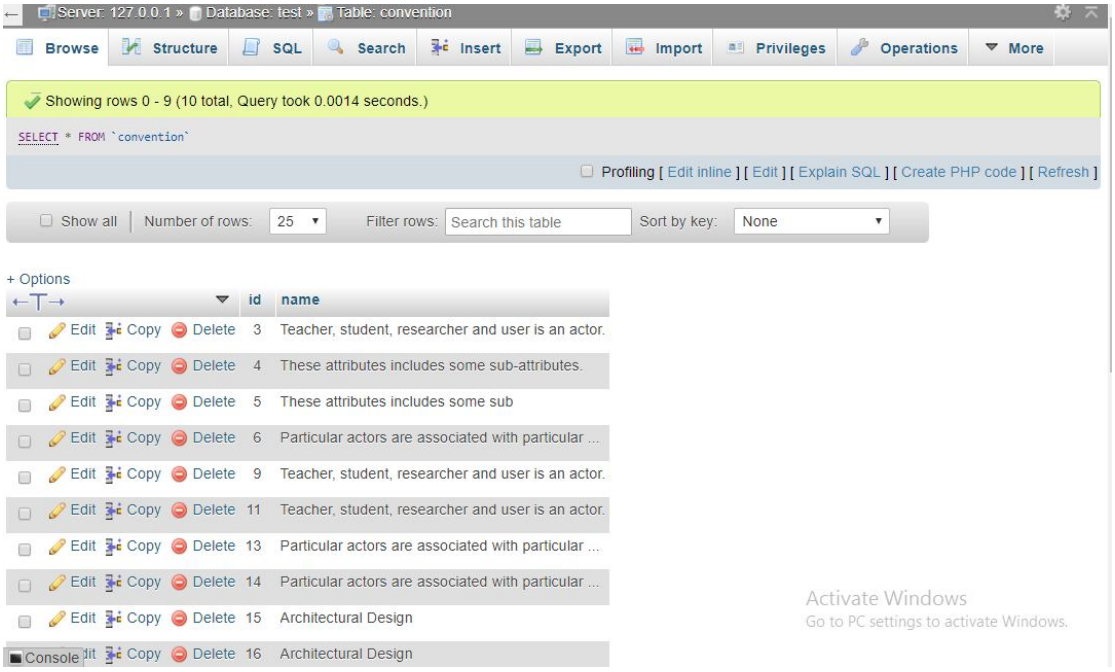

Figure 5. 145**:** Table for Convention

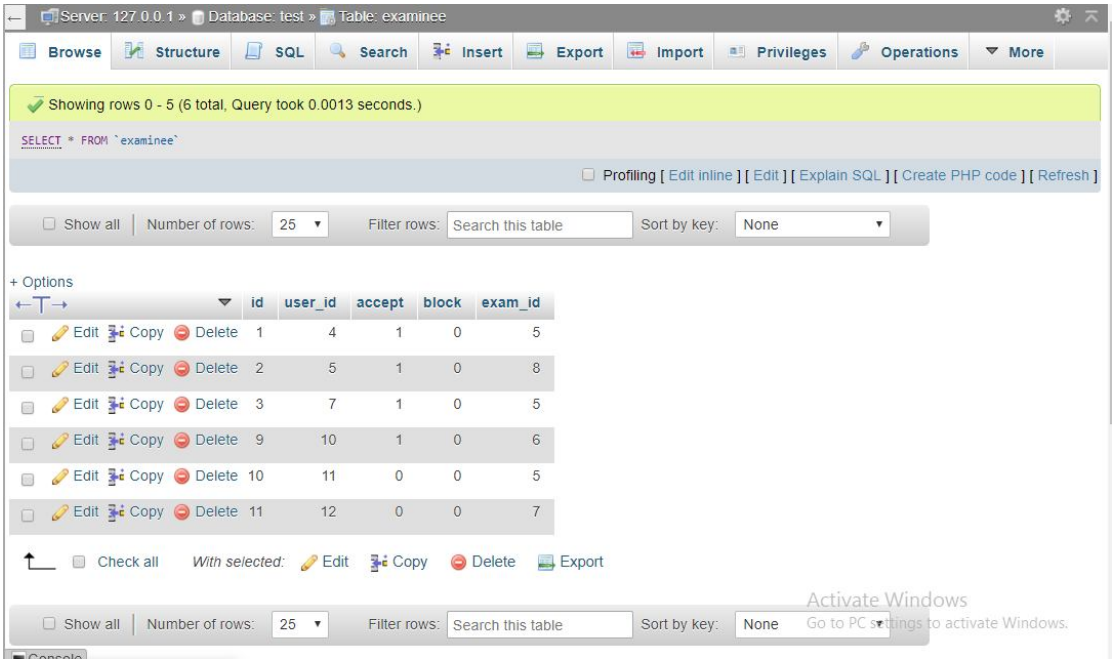

Figure 5. 16**:** Table for Examinee

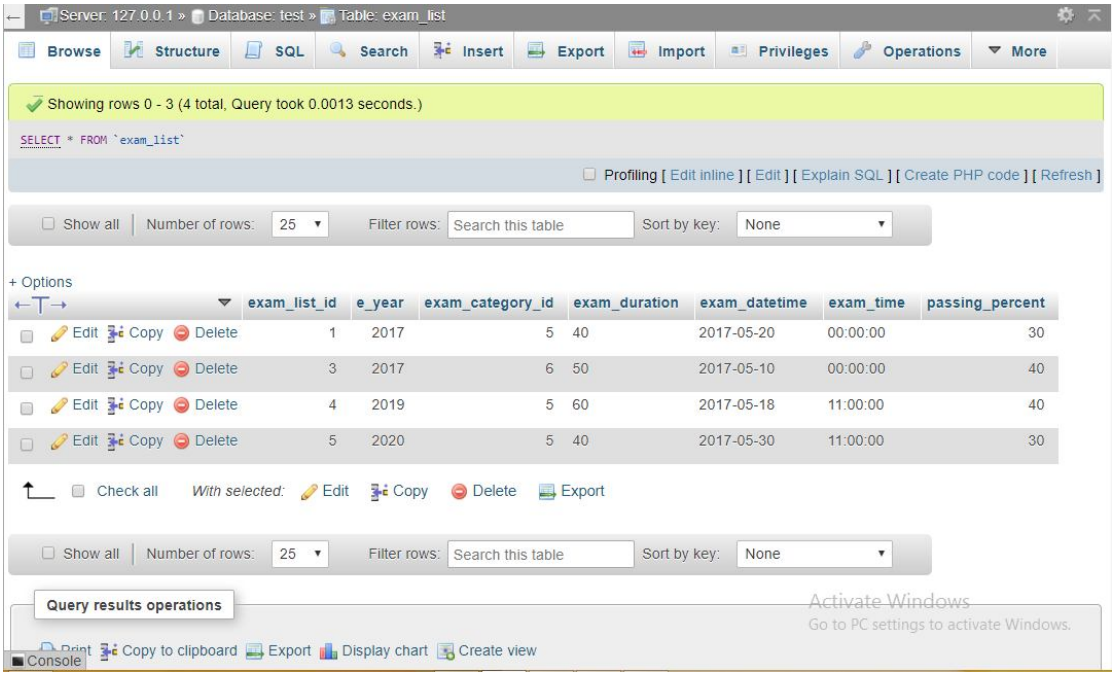

Figure 5. 17**:** Table for Exam List

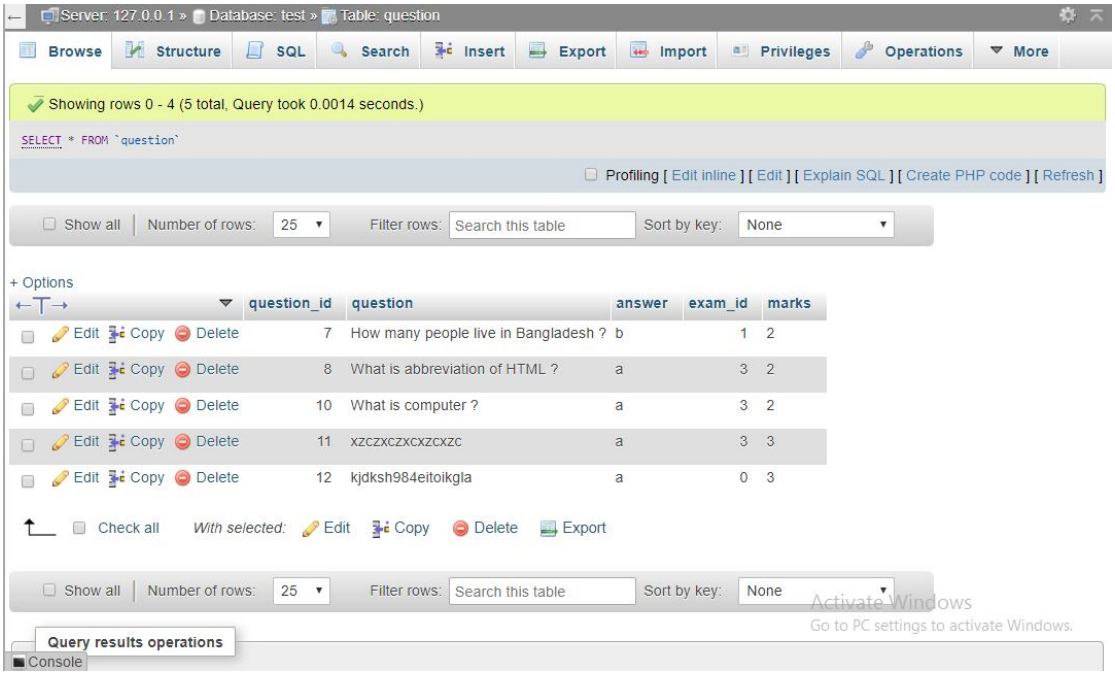

Figure 5. 19**:** Table for Question

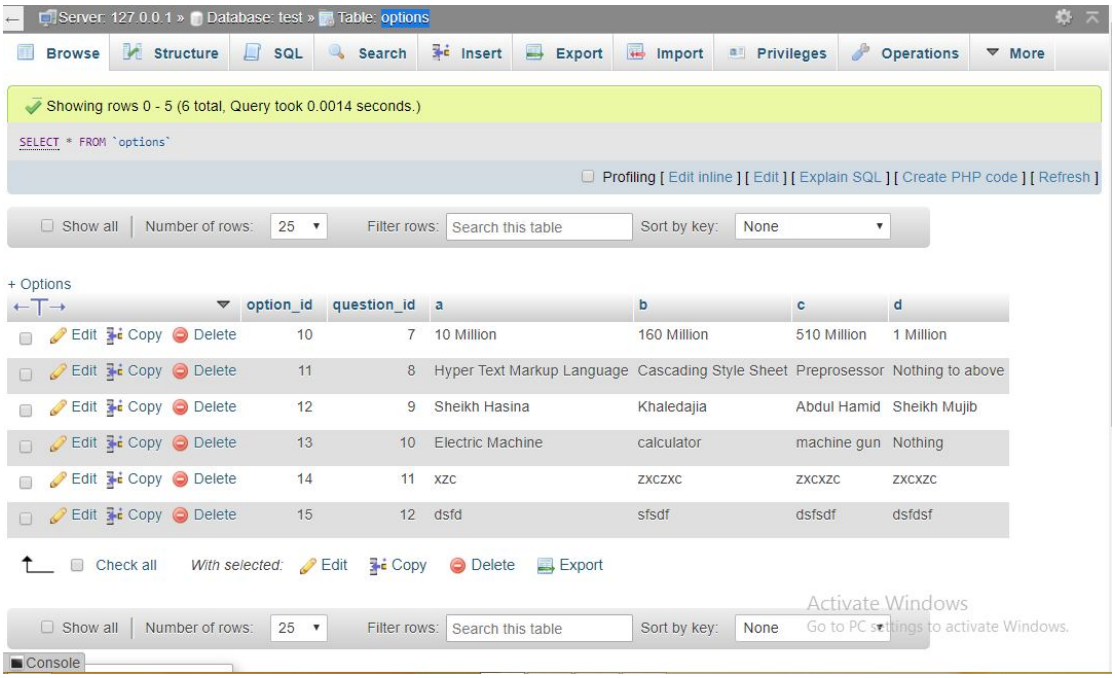

Figure 5.189**:** Table for Option

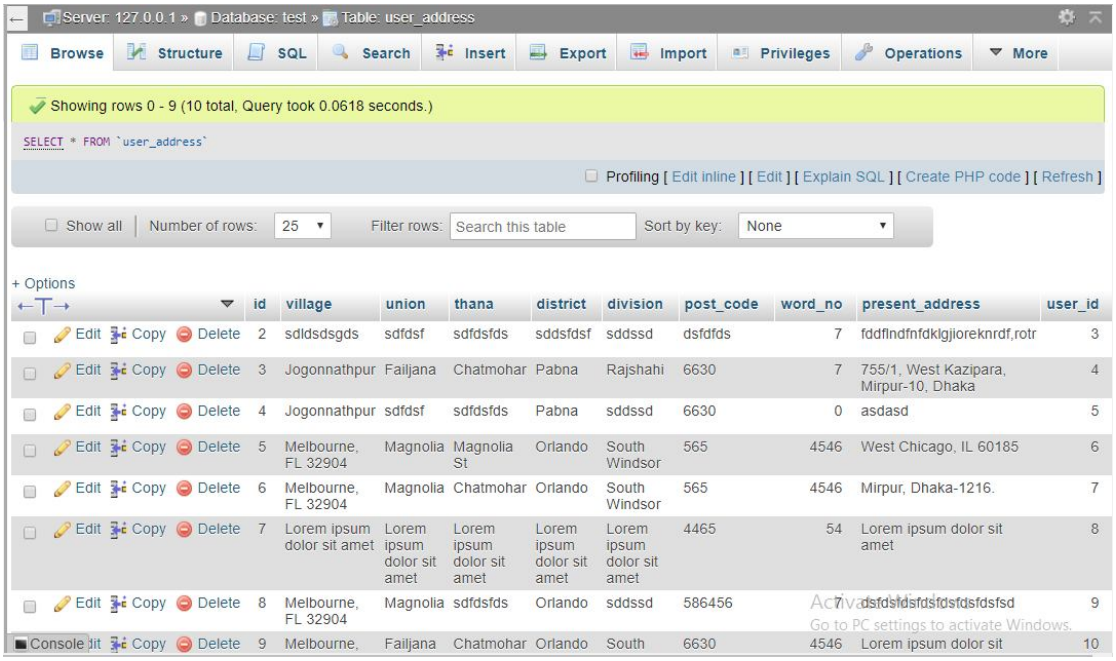

Figure5. 20**:** Table for User Address

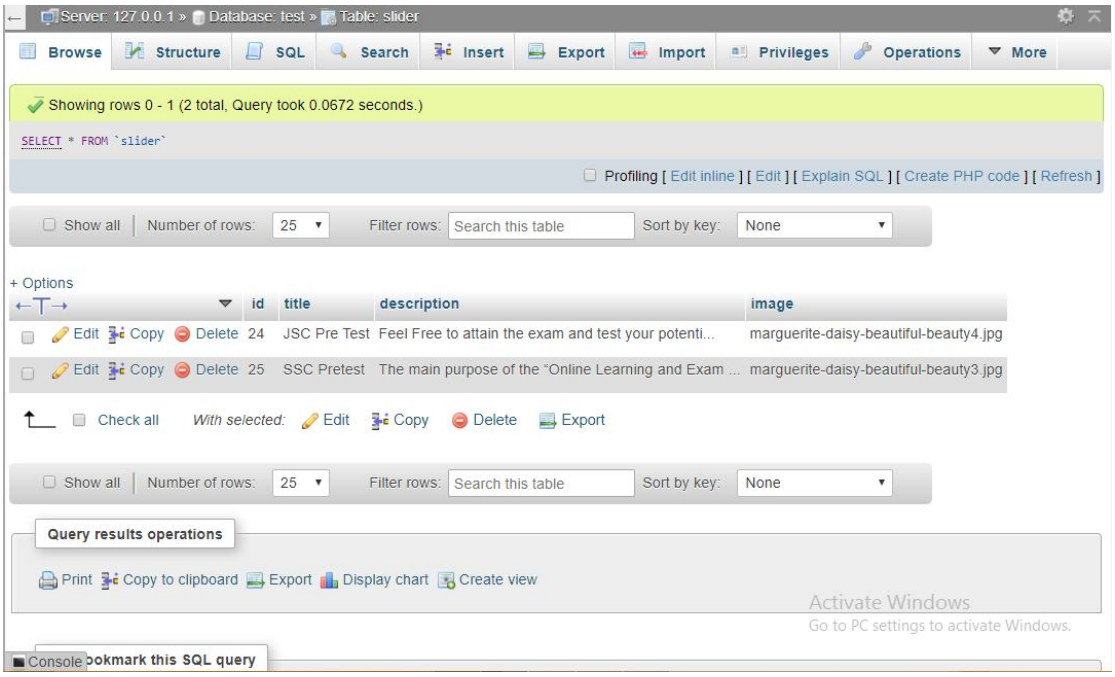

Figure 5.21**:** Table for Slider

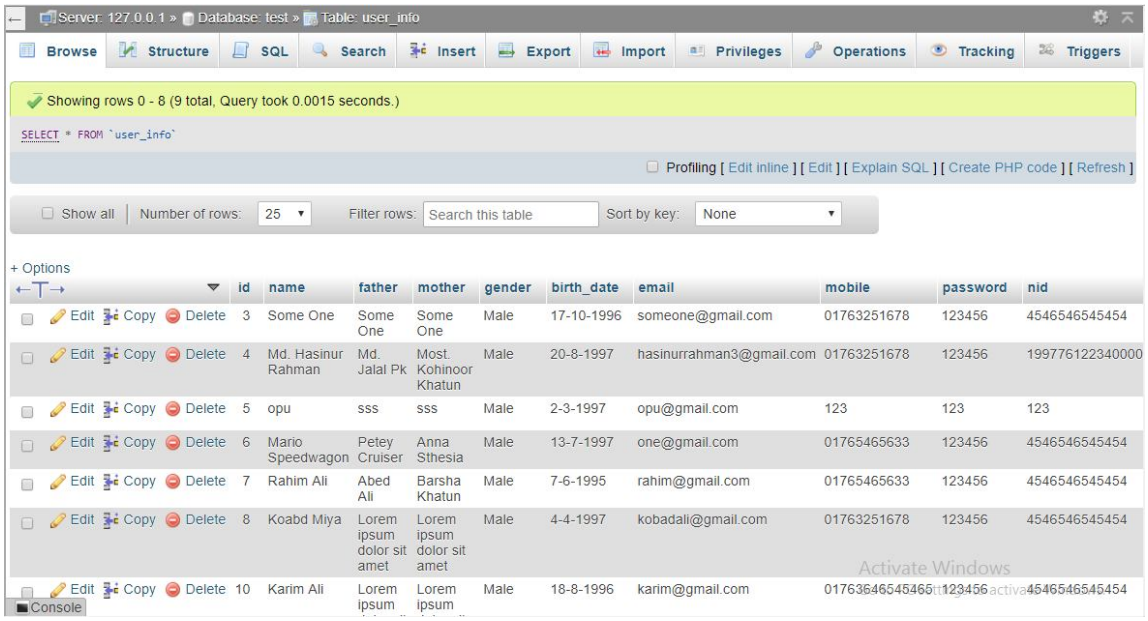

Figure 5. 22**:** Table for User info

CHAPTER 6

Overview and Verification

In this chapter we have represented our application's whole overview and front-end design. This chapter contains some snapshots of our program. The snapshots are given sequentially.

6.1 Overview of Pages and Descriptions

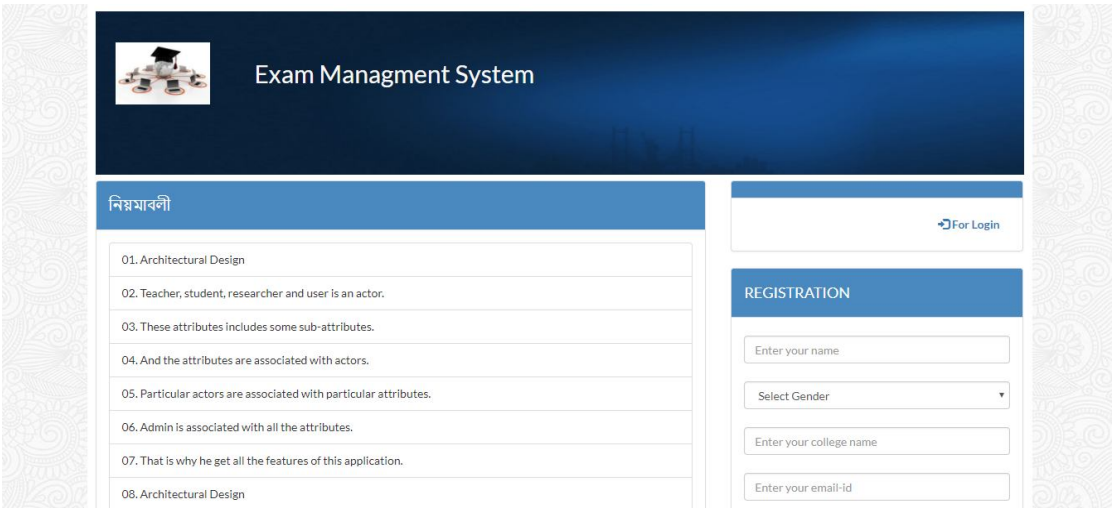

Figure 6.23 : Homepage for Online Learning and Exam System

The above figure is our application's main home page. It has a login bar on the right side for Students. When Student wants to participate in exam He/She must signup and then login for Exam and Learning, Admin can post any types of Creative MCQ Question for finding the best ranking Students.

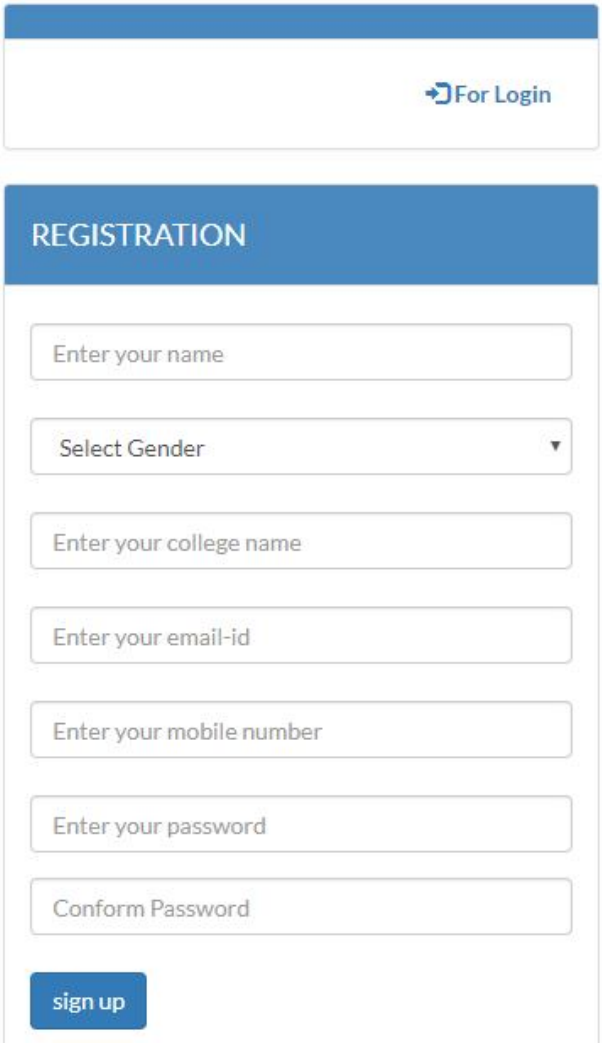

Figure 6.24: Examinee Login Status

The above figure shows the Student login system. It contains login status as a Student. For participating the exam student must sign up and then sign in .

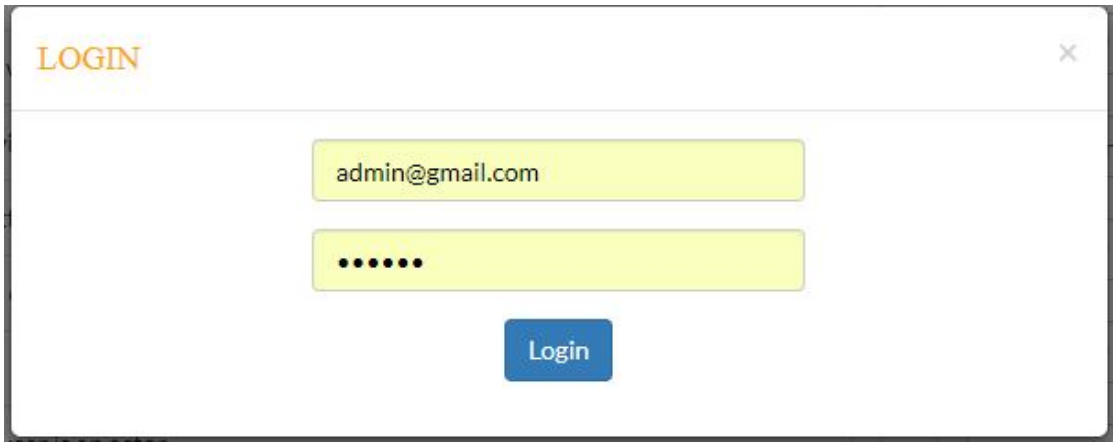

Figure 6. 25: Admin login status

The above figure shows the Login Toast for Examiner .

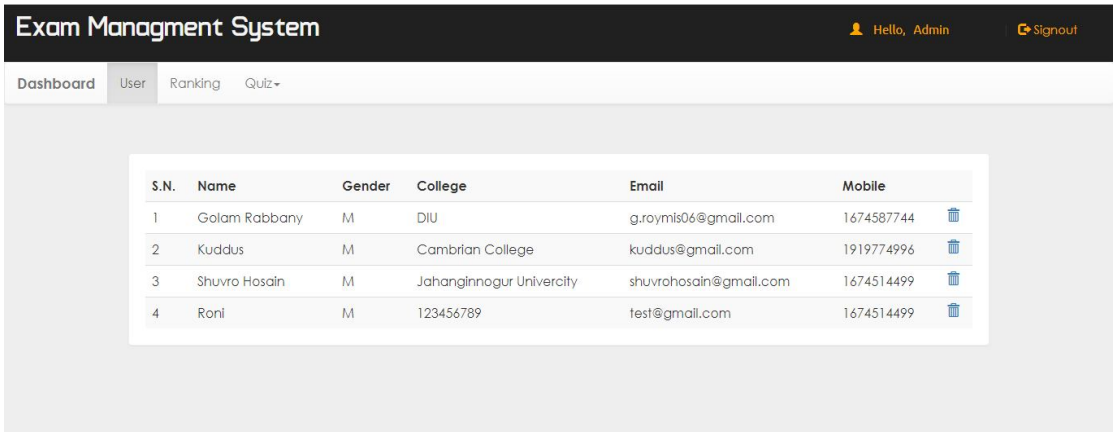

Figure 6. 26 : Admin Dashboard

After login Admin or Examiner it shows dashboard.

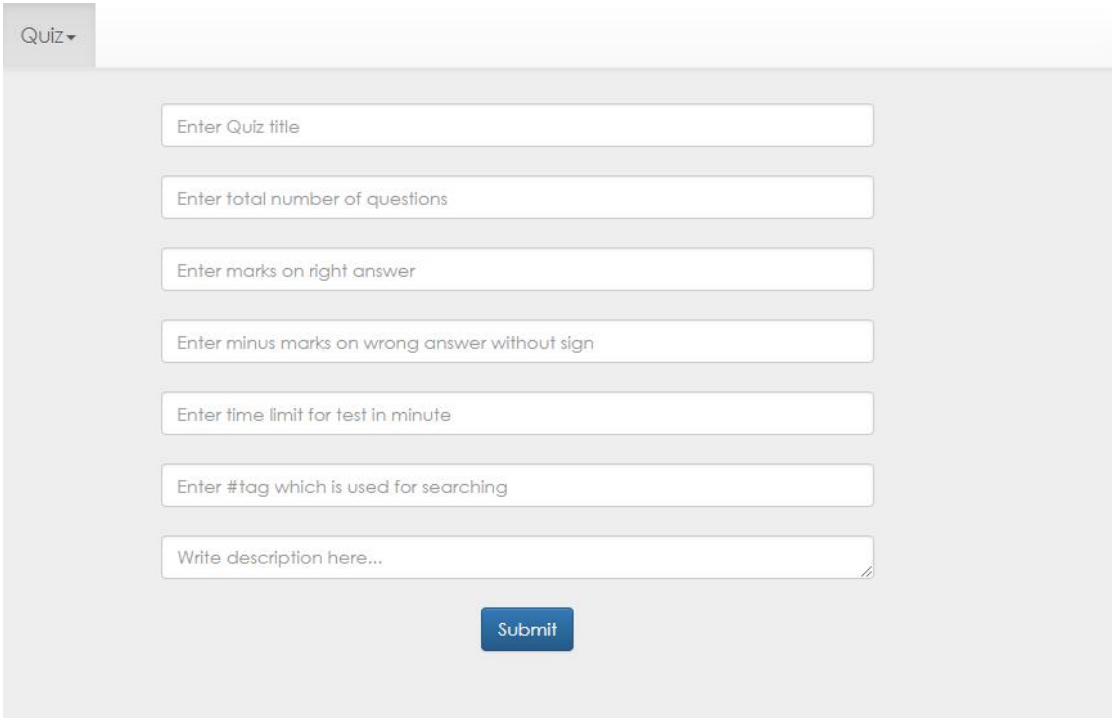

Figure 6. 27 : Creative MCQ Question Input Field

Before creating creative MCQ Question, it contains fillup the types as a multiple choice or descriptive question field will be appeared.

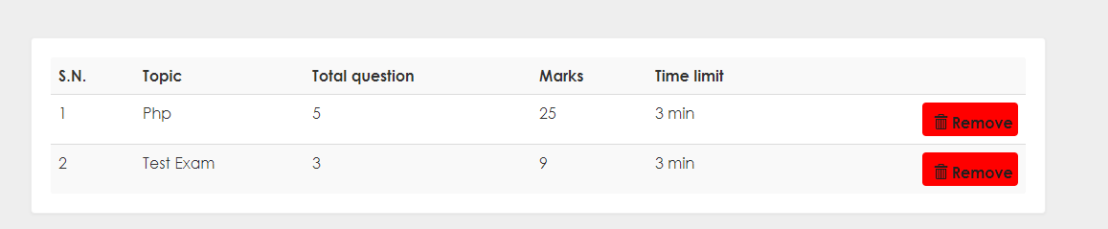

Figure 6. 28 : List of Exams from Admin Dashboard

The above figure shows the list of exams. Admin/Examiner can see all the list of his exams with details. He also can view the question and modify this and change the exam schedule and repeat the question for students. If the question is not needed, he can delete it.

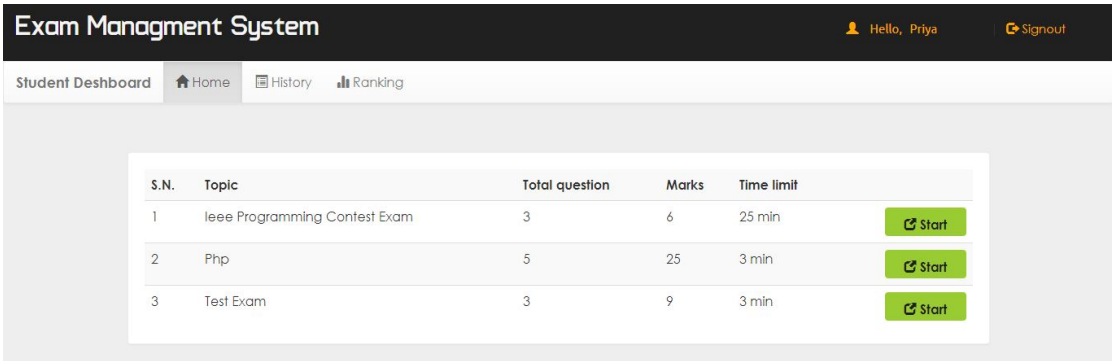

Figure 6.29 : Examinee Dashboard

Examinee can see their Exam Dashboard, Ranking, and History of Other Examinee.

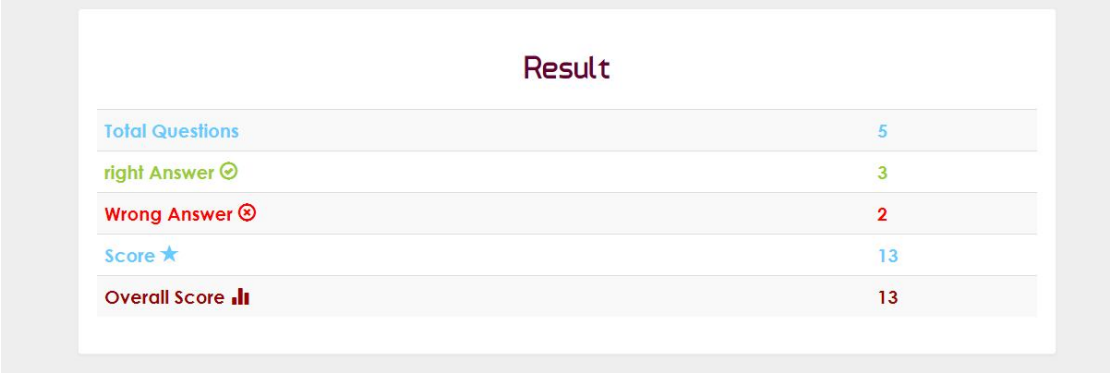

Figure 6.30 : Student Result

The above figure shows the list of student result. In the Marks field Examiner can see the MCQ marks of examinee. In the case of descriptive question Examiner needs to give marks.

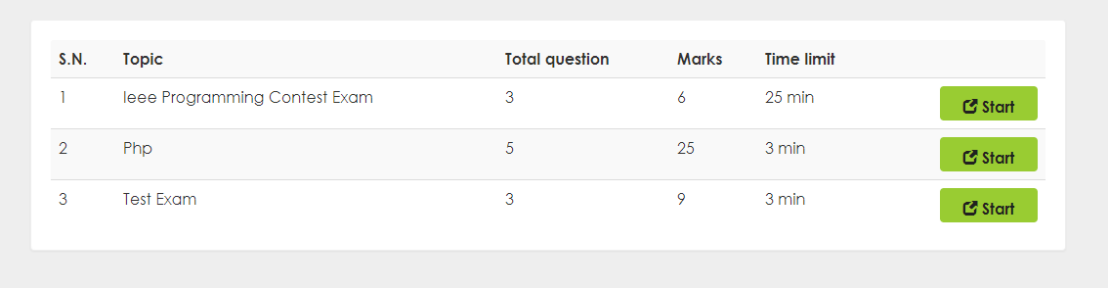

Figure 6.31 : Upcoming Exam for Student Dashboard

The above figure shows the upcoming exam and marks distribution.

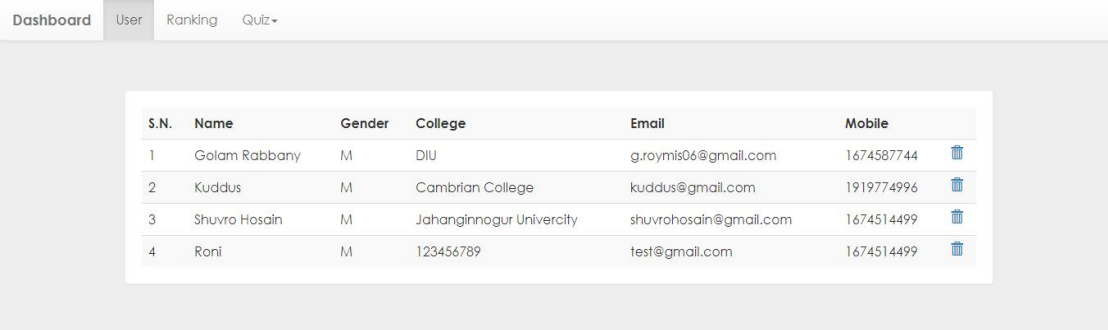

Figure 6.32 : User List in Dashboard

The above figure shows the user list in Dashboard.

6.2Test Case Table for Registration

Table 1 : Test Case Table for Registration

Test Case	**Test Input**	**Expected Output**	**Actual Output**	**Result**	**Tested On**
1. Display the application pages	Tested browsers- ➔ Firefox ➔ Google Chrome ➔ Opera ➔ Safari	To display the pages successfully	Displayed the pages successfully	Passed	17-09-17
2. Username	Blank or incorrect username	To warn that username or correct username must be entered	Showed the warning	Passed	17-09-17
3. Password	Blank or incorrect password	To warn that password or correct password must be entered	Showed the warning	Passed	17-09-17
4. Registration	Without Registration	To Restrict to access the Exam features	Imposed the Restriction	Passed	17-09-17

6.3Test Case Table for Exam System

Table 2 : Test Case Table for Exam System

Test Case	Test Input	Expected Output	Actual Output	Result	Tested On
1. Create exams for Admin	Input exam schedule, title, department and course.	To add it to the question headline and generate exam code to create questions	After pasted the exam code to the search box question field is appeared	Passed	18-09-17
2. View exam list for Admin	Click on the exam list.	The list of exams will be appeared. Teacher can modify the question and repeat the exam by changing the schedule	Exam list is appeared and modification is successfully worked	Passed	18-09-17
3. View result list for Admin	Click on the result list	Student's result list will be appeared. In case of descriptive question teacher need to put the marks on mark field	Result list is appeared and the teacher's mark is successfully updated	Passed	19-09-17
4. Join exam for students	Login and put the exam code to the search box.	Join for exam link will be appeared. After clicking it he can take the exam. In case of MCQ question result is instantly showed	Successfully join for exam link is appeared, exam is taken and result is instantly showed	Passed	19-09-17
5. View result for students	Click on the result list	List of all exam for the particular student will be appeared and he can see the result.	Exam list is appeared and result is showed.	Passed	19-09-17

CHAPTER 7

CONCLUSION

The application has been successfully implemented. After connecting with the application through the local host its overall features and functionalities just works fine. This application's workflow and responsive design is user friendly and efficient enough to work with.

We have encouraged and took initiatives to develop this application because various Organizations need this system in their day to day operations. The Online Exam and Survey System features for creating exams including various departments and courses (IT, commerce, science etc.) This system helps in conducting examinations and publishing its result automatically, all the operations performed by the application itself efficiently which saves a lots of time. With the effective use, any institute or researchers can apply the Online Learning and Exam System for conducting quick examinations.

This project is meant for describing all the features and procedures that were followed while developing the application. This document specially mentions the details of the project how it was developed, the primary requirement, as well as various features and functionalities of the project and the procedures followed in achieving these objectives.

7.1 Limitations

Our application has some limitation. We will overcome this limitations in future. Some of the main limitations are-.

- Only developed for web application.
- We implemented this application through local host, it should have a domain to access the website through the internet.
- Some features need to be included such as extensions and widgets.

7.2 Future Scopes

- Our mission is to make this application for all platform like windows, osx, ios and android.
- Our application's data needs more storage in future, so we will add this with larger database system such as Oracle Database or Microsoft SQL Server.

- We will add more additional features to make it more dynamic to satisfy larger organizations and make this application trusted by them and verified.

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