

# JAVA BASED ONLINE QUIZ PLATFORM

PROBLEM UNDERSTANDING - The Quiz Platform allows:

Admins to approve/reject quizzes.

Quiz creators to create quizzes and add questions. –

Participants to take quizzes and view their results.

Key problems solved: -

Managing quizzes online.

Assigning quizzes to users.

Evaluating participant results.

## 1. Project Definition

This project is a **Web-Based Online Quiz Platform** developed using **Java, JSP, Servlets, JDBC, MySQL, Bootstrap, and MVC architecture**.

It allows Admins, Quiz Creators, and Participants to manage, create, and attempt quizzes online.

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## 2. Purpose of the System

The system automates quiz creation and evaluation.

It replaces manual test creation with a **fast, efficient, user-friendly** online platform.

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## 3. Main Objectives

- Provide **role-based access control** (Admin, Creator, Participant).
  - Allow quiz creators to easily create quizzes and add questions.
  - Allow participants to take quizzes and view results.
  - Allow admins to manage users and approve quizzes.
  - Provide a modern, clean UI using Bootstrap.
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## 4. Overall Workflow

1. User logs in using email & password.
  2. Server checks their role from the database.
  3. Based on the role → Redirect to correct dashboard.
  4. Each user performs role-specific actions.
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## 5. Technologies Used

- **Frontend:** JSP, HTML, CSS, Bootstrap
  - **Backend:** Java Servlets, JDBC
  - **Database:** MySQL
  - **Tools:** NetBeans IDE, Apache Tomcat Server
  - **Architecture:** MVC (Models, Views, Controllers)
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## 6. MVC Architecture Usage

- **Model:** Java classes like *User*, *Quiz*, *Question*
  - **View:** JSP pages like *login.jsp*, *dashboard.jsp*, *take-quiz.jsp*
  - **Controller:** Servlets such as *LoginServlet*, *CreateQuizServlet*
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## 7. Database Integration (JDBC)

The system uses JDBC to:

- Insert quizzes
- Store questions
- Validate login
- Fetch quizzes for participants
- Approve/reject quizzes

Your **DBConnection.java** class manages MySQL connectivity using a config.properties file.

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## 8. User Roles in the System

The system has 3 major user roles:

### ✓ Admin

- Manages users
- Approves or rejects quizzes
- Sees reports

### ✓ Quiz Creator

- Creates quizzes
- Adds questions
- Reviews submissions

### ✓ Participant

- Views available quizzes
  - Takes quizzes
  - Sees results
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## 9. User Authentication

LoginServlet handles:

- Fetching user from DB
  - Checking password
  - Creating a session
  - Redirecting based on role
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## 10. Session Management

Session tracking ensures users cannot:

- Open admin pages without logging in
- Access pages of another role
- Access system after logout

Filters enforce access control.

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## 11. Role-Based Filters

Three filters:

- **AdminFilter** → Protects admin pages
- **CreatorFilter** → Protects creator pages
- **ParticipantFilter** → Protects participant pages

These ensure **security and access control**.

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## 12. Quiz Creation Process

1. Creator enters quiz title + description.
  2. CreateQuizServlet inserts quiz into DB.
  3. Creator is redirected to add-question.jsp.
  4. Add-Question form allows adding unlimited questions.
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## 13. Adding Questions

Each question includes:

- Question text
- Four options
- Correct answer

Stored inside questions table linked by quiz\_id.

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## 14. Quiz Approval Process

Admin views all quizzes in *approve-quiz.jsp*.

Admin can:

- Accept quiz (ApproveQuizServlet)
- Reject quiz (RejectQuizServlet)

Only approved quizzes show for participants.

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## 15. Participant Quiz Flow

1. Participant logs in
  2. Sees list of available approved quizzes
  3. Opens a quiz
  4. Questions display one after another
  5. Participant selects correct answers
  6. System calculates score and stores results
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## 16. Result Calculation

Performed in **SubmitQuizServlet**:

- Fetch correct answers
  - Compare with participant answers
  - Calculate total marks
  - Store result in results table
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## 17. Bootstrap UI Integration

All JSP pages use:

- Navbar
- Cards
- Buttons
- Tables

UI is modern, clean, and responsive.

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## 18. Important Servlet Files (Backbone of Project)

Essential servlets include:

- LoginServlet
- LogoutServlet
- CreateQuizServlet
- AddQuestionServlet
- TakeQuizServlet
- SubmitQuizServlet
- ApproveQuizServlet
- RejectQuizServlet
- ViewQuizServlet
- ResultServlet

These control all major actions.

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## 19. Folder Structure Explanation

Your project maintains:

- **model** → Java classes
- **dao** → Database handling
- **controller** → Servlets
- **filters** → Security filters
- **Web Pages** → All JSP files
- **resources** → config.properties

This ensures a clean maintainable project.

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## 20. Final Outcome

The final system:

Is fully functional

Supports all 3 roles

Has secure authentication

Uses filters for role checks

Allows full quiz creation & evaluation

Has a modern UI

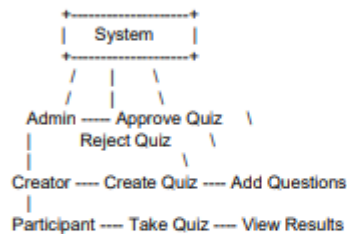
Works as a real professional web application

## 2. USE CASE DIAGRAM

Actors:

- Admin
- Quiz Creator
- Participant
- System

Use Case Diagram (ASCII Representation):



## 3. SEQUENCE DIAGRAM (CREATE QUIZ)

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Creator → System: Open create-quiz.jsp
Creator → System: Submit quiz details
System → DB: INSERT quiz
DB → System: quizId returned
System → Creator: Redirect to add-question.jsp?quizId=...
  
```

## 4. ER DIAGRAM (ASCII)

```

+-----+ +-----+ +-----+
| quizzes | 1 --- n | questions | n --- 1 | options |
  
```

quizzes	questions	options
quiz_id PK	question_id PK	option_id PK
title	quiz_id FK	question_id FK
desc	question_text	option_text