**System Flow Description**

This system encompasses key processes including **user registration/login, exam paper management, mock exams, topic-based practice, performance analysis, progress tracking, and teacher management**. Below is the detailed system flow:

**1. User Registration and Login**

1. The student or teacher accesses the system homepage.

2. Chooses **Register** or **Login**:

• **Registration**:

• Fills in basic details (name, email, role: Student/Teacher).

• Creates a password and verifies the email.

• Completes registration and is redirected to the dashboard.

• **Login**:

• Enters email and password.

• If verified, accesses the user dashboard.

• If unsuccessful, prompts an error message or provides a password recovery option.

**2. Exam Paper Management**

**2.1 Uploading Exam Papers**

1. **Students/Teachers upload past exam papers** (supports images, PDFs, DOCX).

2. **OCR Processing**:

• Extracts question text, marks, and answer options.

• Identifies topics and maps them to the syllabus.

3. **Teacher Review**:

• Student-uploaded exam papers require teacher approval before being added to the database.

• If an exam lacks answers, the system generates answers, which the teacher verifies.

**2.2 Exam Paper Categorization**

1. Exam papers are classified by **Year**, **Subject**, and **Exam Type** (e.g., “AS Level Computer Science H046/01 - June 2018”).

2. Exam questions are automatically mapped to **relevant knowledge points**.

**3. Student Exam Process**

**3.1 Selecting Exam Type**

1. The student logs in and selects **“Start Exam”** from the dashboard.

2. Chooses exam mode:

• **Full Mock Exam**: Selects a complete past paper.

• **Topic-Based Exam**: Selects specific topics from the database to generate a customized test.

**3.2 Taking the Exam**

1. **The system displays exam questions** and starts the timer.

2. The student submits answers:

• Multiple-choice and true/false questions are auto-submitted.

• Subjective answers are manually entered.

3. **Exam Completion**:

• Objective questions are auto-graded.

• Subjective answers are submitted for teacher grading (if applicable).

**3.3 Exam Score Generation**

1. Calculates the total score and displays an overall performance summary:

• Total score, percentage, pass/fail status.

• Score breakdown by topic.

• Knowledge points with the highest error rate.

• Recommended topics for revision.

**4. Topic-Based Practice**

**4.1 Choosing Practice Mode**

1. The student selects **“Topic-Based Practice”** from the dashboard.

2. Selects:

• **Number of Questions** (the system randomly generates the specified number of questions).

• **Knowledge Points** (focuses practice on specific topics).

**4.2 Practice Session**

1. **The system presents practice questions**.

2. The student answers and receives **immediate feedback** (correct/incorrect).

3. Upon completion, the system generates **a knowledge point analysis**:

• Accuracy for the selected topic.

• Historical practice trends.

• Suggested areas for improvement.

**5. Progress Tracking and Analysis**

**5.1 Personal Learning Insights**

1. **Exam Performance Trends**:

• Tracks the student’s score progression across multiple exams.

• Compares recent exams to analyze improvement or decline.

2. **Error Analysis**:

• Identifies knowledge points with recurring mistakes.

• Lists topics with the highest error rates and suggests focused revision.

**5.2 Practice Habit Analysis**

1. Tracks **practice frequency per knowledge point**.

2. Detects:

• Topics with low practice but high error rates.

• Topics with frequent practice but persistent errors, suggesting a need for alternative learning methods.

**6. Teacher Management**

**6.1 Student Performance Insights**

1. Teachers can view:

• Each student’s exam scores and progress.

• Knowledge points mastered and weak areas.

2. Generates **a class-wide knowledge mastery report**.

**6.2 Exam Paper and Question Bank Management**

1. **Review newly uploaded exam papers** and verify answer accuracy.

2. **Adjust question categorization** to ensure correct knowledge point mapping.

3. **Maintain the question bank** and ensure high-quality resources.

**7. Future Enhancements**

• **AI-Powered Personalized Learning**: Automatically recommends practice questions based on student weaknesses.

• **Smart Mistake Tracking**: Allows students to bookmark incorrect questions for review.

• **Automated Exam Paper Generation**: AI-generated mock exams aligned with syllabus difficulty levels.