# **TOPIC:** Exams creating and managing system for teachers/lecturers

#### **CHAPTER 1**

#### 1. GENERAL INTRODUCTION

In recent years, "Information Technology" has made it way to every part of our life and developed strongly in our country. The convenience and easiness of Information Technology applications is so crucial that we use them in almost all areas of life such as in education, businesses, agencies, industries, health care... We used to do it all by hands and papers, especially in education where thousands of paperwork need to be done precisely and fast. Time is of the essence and this has to change.

Even as of today, simple software like MS Word and Excel are still used in education for managing paperwork, from simple timetables to complicated e-bank storing, managing and distributing. We need something that is cheap, easy to use, to access from anywhere, anytime. To save time is to reduce the cost of everything else, and that is the main objective of a management system.

The system our team is building is based on a website, with its own database and functions, all included in a single URL that you can access via a web browser.

Building a complete system requires many factors. As a matter of fact, software engineering procedures must be followed precisely. Although we tried our best, due to limited time and limited conditions and lack of information at first, it is inevitable that there are shortcomings in this report. Without further ado, below are the details of how the system works and its prototype.

#### 2. PROJECT INTRODUCTION

2.1. Name of project:

Developing software to manage exam questions and grading for teachers

2.2. List of project teams:

Hồ Văn Hiệu \_19521497 (leader) Nguyễn Thị Minh Loan \_ 20521542 Dương Minh Thành 17521044

2.3. Project implementation time:

Total time: 1 Month

Start date: October 22, 2022 End date: November 22, 2022

#### 3. TARGET

Complete project work according to technical requirements, within budget, on schedule (Technical - Financial - Time)

Project management is the application of tools, knowledge, and techniques to define, plan, implement, organize, control, and close projects.

Building a software to "manage the making and marking of exams" in order to systematically improve the quality of management, reduce human labor, search, store and report statistical information easily and accurately

#### 4. PROPOSED SOLUTIONS

E-Bank management and assessment are complicated tasks, requiring managers to have meticulous, thoughtful and scientific management methods. However, as data tends to grow larger, the number of E-bank questions increases, with different subjects, courses, the job of administrators becomes more and more problematic. The only solution to this problem is: to store them all on a computer. And specifically, online.

#### 4.1. Schedule management

Teachers and lecturers will find hard it hard to reserve a room at a particular time for planning an exam without any means to check for reservations, as for the school to manage and consult with the responsible teachers/lecturers. A schedule system is in need to ensure teachers and lecturers can coordinate time and place for an upcoming exam in the most scientific way possible.

#### 4.2. Planning, arranging and assessing exams manually

Teachers and lecturers can create, edit and plan an exam manually on the system, with rules and orders applied to ensure consistency and precision. An assessment will also be automatically created after an exam has ended or after a particulate date, with a deadline and objectives assigned by the administrators of the system (high level personnel of the school, responsible faculties v.v..). Questions for an exam can also be manually and customarily created. They will then be collected and stored in the E-bank database.

#### 4.2.1. Regularly review and check

While choosing the exam questions, the teacher can mess up the position of each question. Therefore, to be able to ensure the position of each exam question in the library, regularly review and check each item to detect problems that arise, and find ways to fix them in a timely manner. For that matter the system also support removing, editing exam, test questions.

When a new exam is imported to the E-bank database, it requires the teacher/lecturer's account and authentication to enable access to the E-bank database, then from there the new exam will receive a code that is associated with the responsible uploader.

Teachers/Lecturers can only obtain an account from the school's system administrators. Teachers/Lecturers must fill in all the required information on the registration form. The administrators will check the information whether if they are correct and will proceed to save the information in the system, granting an account for them.

Each account contains the teacher/lecturer's basic information, the department he/she is in, a schedule for exams, assessment results and the ability to access the E-bank database at will. The teacher/lecturer can also add, edit exams created by them but not others', and exams will be validated once uploaded into the database.

The administrators report directly back to the school.

#### 4.2.2. System building

As mentioned in 1., the system will be a website, including its own database and functions like grading, assessment and schedule management, exams planning and making. The website will be built based on:

Front end: HTML5, CSS, Java script

Back end: JavaLibrary: Node.js

Database: SQL server, SSMSDesign prototype: Figma

■ Testing platform (browser): Google Chrome(MS Windows 10)

#### 4.3. Required list

#	Name of requirements	Form	Rules	Notes
1	Compose the question	Form 1	Rule 1	
2	Compose the exam	Form 2	Rule 2	
3	Score recognition	Form 3	Rule 3	
4	Look up the exams	Form 4	Rule 4	
5	Make annual report	Form 5	Rule 5	

#### 4.4. List of forms and requirements

#### 4.4.1. Requirements for making a list of questions

Form 1		QUESTION
	Subject:	
	Level:	
	The content of the question:	

#### Rule 1:

- The lecturer is currently teaching 4 subjects.
- There are 4 difficulty levels (Easy, Medium, Complex, Hard).
  - 4.4.2. Requirements for making a list of exam

Form 2	EXAM	
	Exam name:	Class name:
	Exam duration:	Exam form:
	Times:	
Question 1	Question 1: The content of the question 1.	
Question 2	Question 2: The content of the question 2.	

#### Rule 2:

- There are two forms of the exam (documented, non-documented).
- The test has a maximum of 5 questions.
- A subject has a maximum of two exams (1st time, 2nd time).
- The lecturer estimates the number of classes taught in a year to be 50 classes
- The maximum exam duration is 180 minutes and the minimum is 30 minutes.
  - 4.4.3. Requirements for making the result

Form 3	EXAM RESULTS				
	Exam name:				
	Class	name:			
	Instru	actor's name:			
#	Student ID	Full name	Scores	Letter point	Notes
1					
2					

Rule 3: Minimum score is 0 and maximum is 10

### 4.4.4. Requirements for making list of the exam

Form 4 LIST OF EXAM					
#	Exam code	Class name	Exam duration	Exam day	Exam form
1					
2					

#### 4.4.5. Requirements for making annual report

Form 5 THE REPORT
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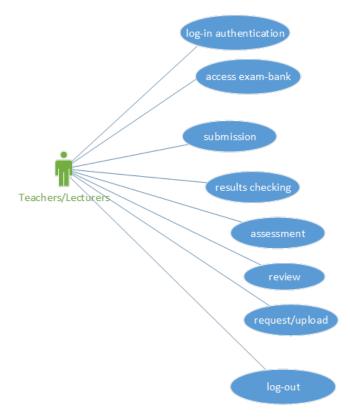
	Year:				
Total exams:			Total marks:		
#	# Subject name Number of exams Total marks Exam rate Score rate		Score rate		
1					
2					

# **CHAPTER 2**

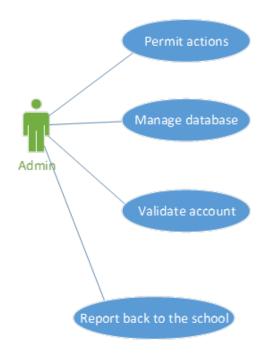
- 5. Use Case model
  - 5.1. List of Actor

#	Actor	Meaning, Notes
1	Instructor	Responsible for creating questions and exam
2	Students	View, search the list of exam
3	Management	Manage data, add/remove accounts
4	Principal	The full access

- 5.2. Use case diagram
  - 5.2.1. Use case for instructors



5.2.2. Use case for Admin



### 5.3. List of Use case

#	Use case	Meaning
1	Log-in	Log-in using an account
2	Log-out	Log-out from the system
3	Access E-bank	Access the exam-bank of the school
4	Submit	Task and work submission
5	Check results	Exams' results checking
6	Assess exams	Exams' grading and valuation
7	Review	Exams review
8	Request/Upload	Create(request) and upload test questions to the E-bank
9	Permit actions	Permit actions of the TEACHER/LECTURER actor
10	Manage database	Database management
11	Validate account	Account validation
12	Report	Report details back to the school

# 5.4. Use case Specification

# 5.4.1. Log-in

	Use case Log-in		
Describe	Log-in using an account		
Agent	Lecturers, administrator		
Main stream	Agent's behavior	System's behavior	
	1. User clicks on login button	2. Show login form	
	3. Enter the username and password	4. Check account name and	
	in the form	password	
		5. Successful login message	
		6. Switch to main interface	
Alternative stream	A1. User entered wrong		
	account/password		
	5. Requires re-login		
	Go back to step 2		

Preconditions	Must be a teacher or administrator
	with an account on the system
Following conditions	Logged in to the system

# 5.4.2. Log-out

	Use case Log-out			
Describe	Log-out from the system	Log-out from the system		
Agent	Lecturers, adminnistrator			
Main stream	Agent's behavior	System's behavior		
	1. User clicks on logout button	2. Show logout form		
		3. Successful logout		
		message		
Alternative stream				
Preconditions	Logged into the system			
Following conditions		·		

#### 5.4.3. Access E-bank

Use case Access E-bank		
Describe	Access the exam-bank of the school	
Agent	Lecturers	
Main stream	Agent's behavior System's behavior	
	1. User clicks on "Test bank" button	2. Show list of "Test bank"
	3. Select the exam users want to see	4. Show the content of the
		exam
Alternative stream		
Preconditions	The agent has logged into the	
	system.	
Following conditions		

### 5.4.4. Submit

	Use case Submit		
Describe	Task and work submission		
Agent	Lecturers	Lecturers	
Main stream	Agent's behavior	System's behavior	
	1. Create the assessment details	2. Show "STEP1:Create the	
		assessment details" form	
	3. Enter the requested information	4. The screen will skip to	
		STEP 2: Adding questions	
	5.Create the questions	6. The interface screen will	
		move to STEP 3: Begin	
		assessment	
		- Begin assessment later	
		- Begin assessment now	
	Agent chooses 1 of 2 choices		
Alternative stream			

Preconditions	Logged in to the system
Following conditions	

#### 5.4.5. Check results

	Use case Check results	
Describe	Exams' results checking	
Agent	Lecturers	
Main stream	Agent's behavior	System's behavior
	1. User clicks on the "Check results" button	2.Displays the list of topic
		1.51.1.1.1.
	3. Select the topic	4. Displays the list, scores of students who have taken the topic and display the top 10 students with the highest scores in the topic
Alternative stream		
Preconditions	Must be a teacher or administrator with an account on the system	
Following conditions		

### 5.4.6. Assess exams

Use case Assess exams		
Describe	Exams' grading and valuation	
Agent	Lecturers	
Main stream	Agent's behavior	System's behavior
	1.	2. Show login form
	3. Enter the username and password	4. Check account name and
	in the form	password
		5. Successful login message
		6. Switch to main interface
Alternative stream	A1. User entered wrong	
	account/password	
	5. Requires re-login	
	Go back to step 2	
Preconditions	Must be a teacher or administrator	
	with an account on the system	
Following conditions	Logged in to the system	<u> </u>

#### 5.4.7. Review

Use case Review			
Describe	Exams review	Exams review	
Agent	Lecturers	Lecturers	
Main stream	Agent's behavior	System's behavior	
	1.	2. Show login form	

	3. Enter the username and password	4. Check account name and
	in the form	password
		5. Successful login message
		6. Switch to main interface
Alternative stream	A1. User entered wrong	
	account/password	
	5. Requires re-login	
	Go back to step 2	
Preconditions	Must be a teacher or administrator	
	with an account on the system	
Following conditions	Logged in to the system	

# 5.4.8. Request/Upload

Use case Review			
Describe	Create(request) and upload test		
	questions to the E-bank		
Agent	Lecturers	Lecturers	
Main stream	Agent's behavior System's behavior		
	1.	2. Show login form	
	3. Enter the username and password	4. Check account name and	
	in the form	password	
		5. Successful login message	
		6. Switch to main interface	
Alternative stream	A1. User entered wrong		
	account/password		
	5. Requires re-login		
	Go back to step 2		
Preconditions	Must be a teacher or administrator		
	with an account on the system		
Following conditions	Logged in to the system		

# 5.4.9. Permit actions

Use case Review			
Describe	Permit actions of the		
	TEACHER/LECTURER actor		
Agent	Lecturers	Lecturers	
Main stream	Agent's behavior	Agent's behavior System's behavior	
	1.	2. Show login form	
	3. Enter the username and password	4. Check account name and	
	in the form	password	
		5. Successful login message	
		6. Switch to main interface	
Alternative stream	A1. User entered wrong		
	account/password		
	5. Requires re-login		
	Go back to step 2		
Preconditions	Must be a teacher or administrator		
	with an account on the system		

Following conditions	Logged in to the system

# 5.4.10. Manage database

Use case Review		
Describe	Database management	
Agent	Lecturers	
Main stream	Agent's behavior System's behavior	
	1.	2. Show login form
	3. Enter the username and password	4. Check account name and
	in the form	password
		5. Successful login message
		6. Switch to main interface
Alternative stream	A1. User entered wrong	
	account/password	
	5. Requires re-login	
	Go back to step 2	
Preconditions	Must be a teacher or administrator	
	with an account on the system	
Following conditions	Logged in to the system	

### 5.4.11. Validate account

Use case Review		
Describe	Account validation	
Agent	Lecturers	
Main stream	Agent's behavior System's behavior	
	1.	2. Show login form
	3. Enter the username and password	4. Check account name and
	in the form	password
		5. Successful login message
		6. Switch to main interface
Alternative stream	A1. User entered wrong	
	account/password	
	5. Requires re-login	
	Go back to step 2	
Preconditions	Must be a teacher or administrator	
	with an account on the system	
Following conditions	Logged in to the system	

# 5.4.12. Report

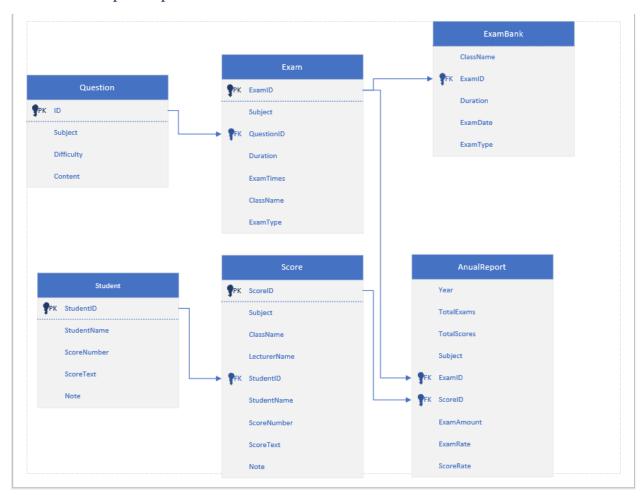
	Use case Review	
Describe	Report details back to the so	chool
Agent	Lecturers	
Main stream	Agent's behavior	System's behavior
	1.	2. Show login form

	3. Enter the username and password	4. Check account name and
	in the form	password
		5. Successful login message
		6. Switch to main interface
Alternative stream	A1. User entered wrong	
	account/password	
	5. Requires re-login	
	Go back to step 2	
Preconditions	Must be a teacher or administrator	
	with an account on the system	
Following conditions	Logged in to the system	

# CHƯƠNG 3. PHÂN TÍCH

# 3.1. Sơ đồ lớp

# 3.1.1. Sơ đồ lớp mức phân tích



# 3.1.2. Danh sách các lớp đối tượng

STT	Tên lớp
1	Câu hỏi
2	Bài thi
3	Kho bài thi

4	Điểm
5	Báo cáo năm
6	Học sinh

# 3.1.3. Danh sách quan hệ

STT	Tên quan hệ
1	Câu hỏi_Bài thi
2	Bài thi_Kho bài thi
3	Học sinh_Điểm
4	Điểm_Báo cáo năm
5	Bài thi Báo cáo năm

# 3.1.4. Mô tả từng lớp đối tượng

### 3.1.4.1 Câu hỏi

Mô tả	Thuộc tính và hàm	Diễn giải
Lưu thông tin câu hỏi	ID	Mã câu hỏi
	Subject	Têm môn học
	Difficulty	Độ khó
	Content	Nội dung câu hỏi

### 3.1.4.2 Bài thi

Mô tả	Thuộc tính và hàm	Diễn giải
Lưu thông tin câu hỏi	ExamID	Mã bài thi
	Subject	Tên môn học
	QuestionID	Mã câu hỏi
	Duration	Thời lượng làm bài
	ExamTimes	Số lần làm bài thi
	ClassName	Tên lớp
	ExamType	Loại bài thi

### 3.1.4.3 Kho bài thi

Mô tả	Thuộc tính và hàm	Diễn giải
Lưu thông tin câu hỏi	ClassName	Tên lớp
	ExamID	Mã bài thi
	Duration	Thời lượng làm bài
	ExamDate	Ngày làm nài thi
	ExamType	Loại bài thi

### 3.1.4.4 Học sinh

Mô tả	Thuộc tính và hàm	Diễn giải
Lưu thông tin câu hỏi	StudentID	Mã học sinh

StudentName	Tên học sinh
ScoreNumber	Điểm số
ScoreText	Điểm chữ
Note	Ghi chú

# 3.1.4.5 Điểm

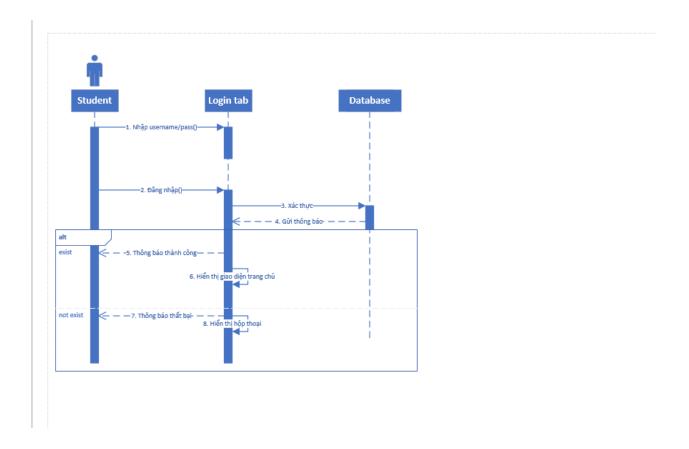
Mô tả	Thuộc tính và hàm	Diễn giải
Lưu thông tin câu hỏi	ScoreID	Mã điểm số
	Subject	Tên môn học
	ClassName	Tên lớp
	LecturerName	Tên giảng viên
	StudentID	Mã học sinh
	StudentName	Tên học sinh
	ScoreNumber	Điểm số
	ScoreText	Điểm chữ
	Note	Ghi chú

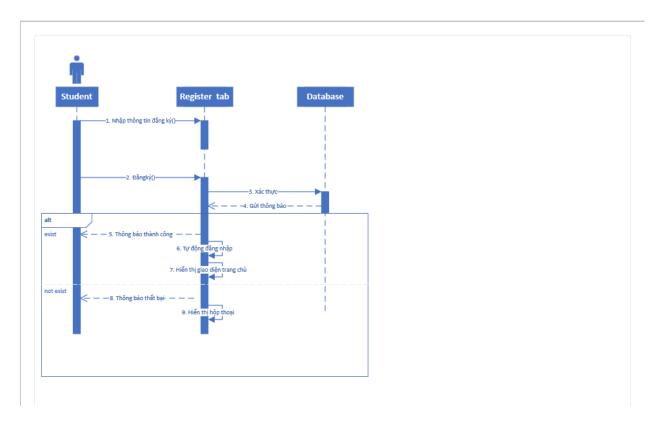
### 3.1.4.6 Báo cáo năm

Mô tả	Thuộc tính và hàm	Diễn giải
Lưu thông tin câu hỏi	Year	Năm
	TotalExams	Tổng số bài thi
	TotalScore	Tổng số bài chấm
	Subject	Tên môn học
	ExamID	Mã bài thi
	ScoreID	Mã điểm số
	ExamAmount	Số lượng bài thi
	ExamRate	Tỉ lệ bài thi
	ScoreRate	Tỉ lệ điểm

# 3.2. Sơ đồ tuần tự

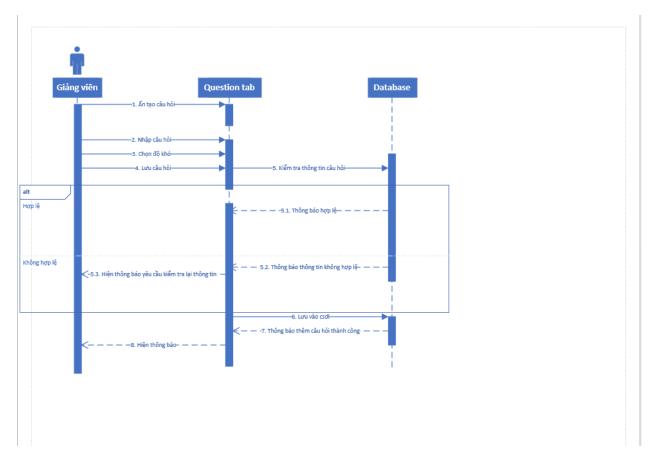
3.2.1. Đăng nhập / Đăng xuất / Đăng ký



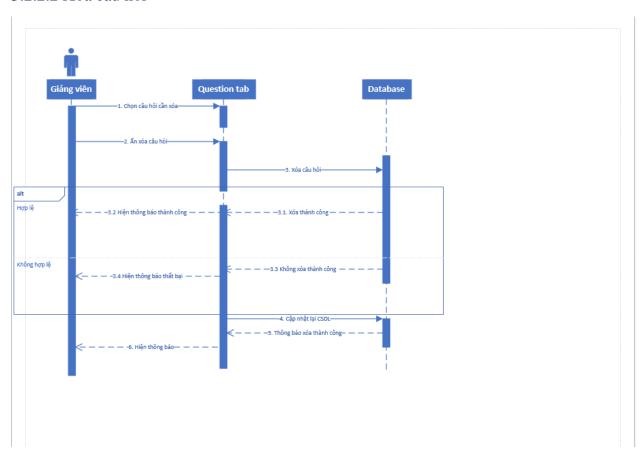


# 3.2.2. Soạn câu hỏi

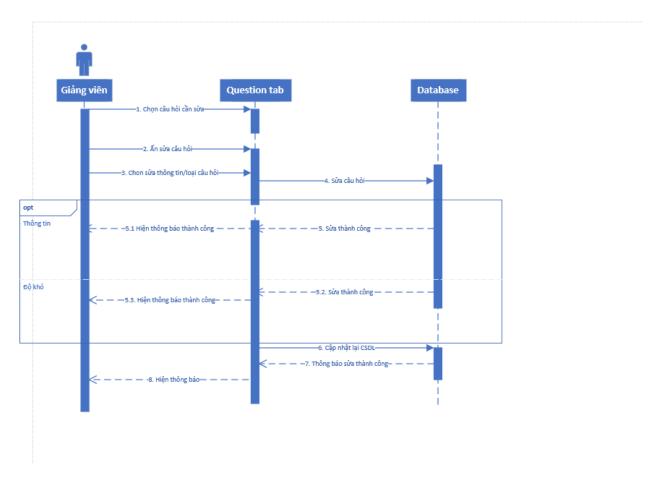
### 3.2.2.1 Thêm câu hỏi



### 3.2.2.2 Xóa câu hỏi

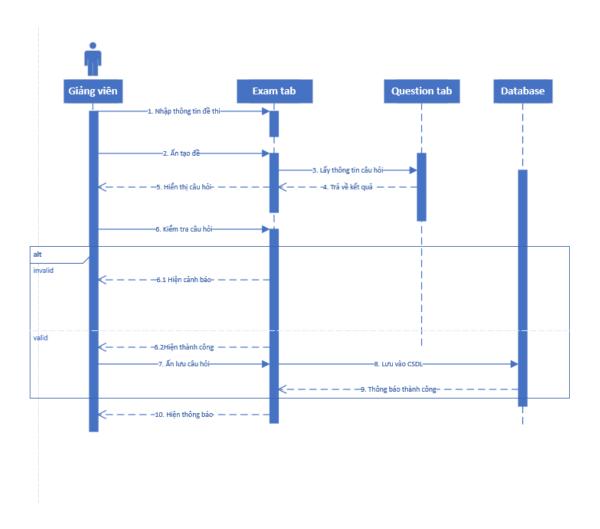


### 3.2.2.3 Sửa câu hỏi

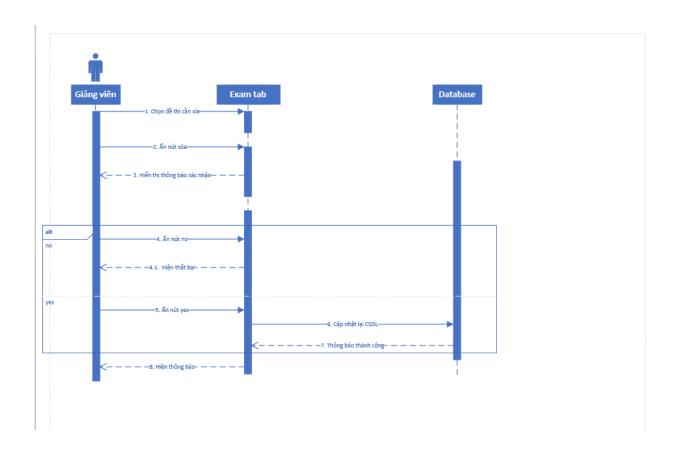


### 3.2.3. Soạn bài thi

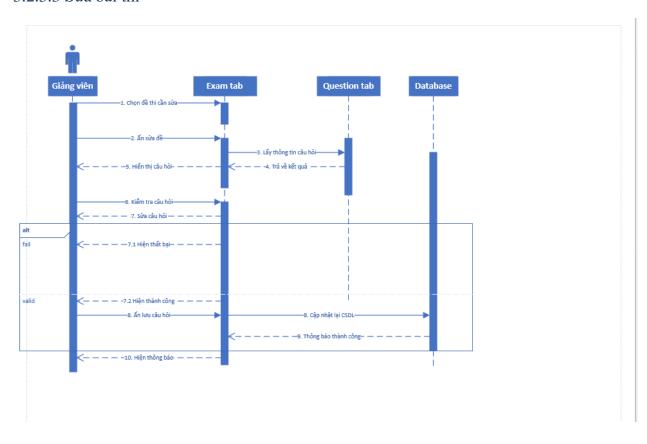
# 3.2.3.1 Sửa bài thi



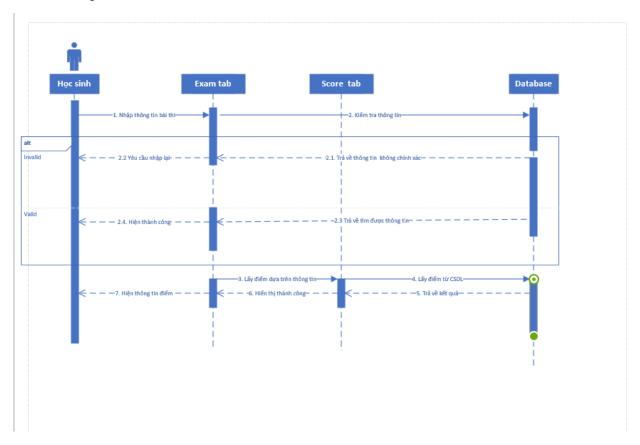
# 3.2.3.2 Xóa bài thi

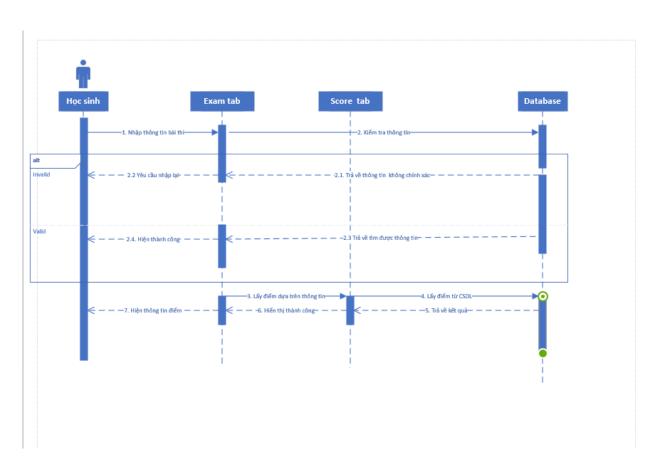


### 3.2.3.3 Sửa bài thi



# 3.2.4. Kết quả chấm thi





# 3.2.6. Kết quả chấm thi

# **CHAPTER 4**

# **CHAPTER 5**

# **INTERFACE DESIGN**

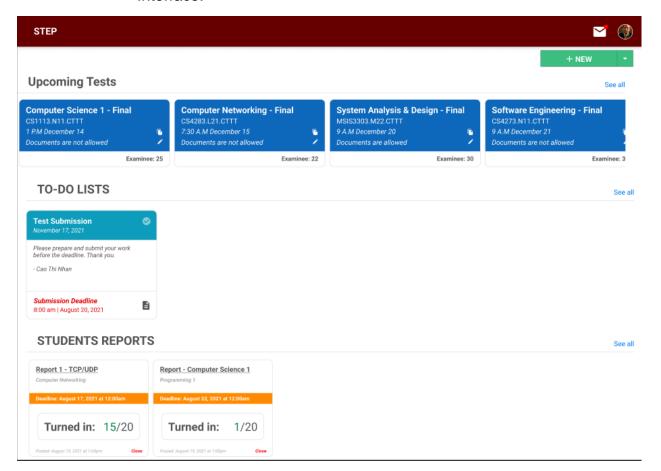
### 1.1. List of pages

	List of pages			
#	Name	Type	Function	
1	Log-in	Input page	Allows user to log in	
2	Dashboard	Main page	Displays information about exams schedule, students' reports and to-do list	
3	My Department	Information page	Displays information about users departments and functions inside of it	
3.1	Assessment		Allows users to assess exams and check for finished ones	
3.1.1	Exam Summary	Information page	Displays exam summary	
3.1.2	Create Assessment Adding details	Input page	Allows users to create an assessment and add details like duration, location, title, description	
3.1.3	Create Assessment Adding questions		Allows users to add questions from My Test Bank to the assessment	
3.1.4	Create Assessment Begin assessment		Allows users to schedule the newly created assessment	
3.2	Submission		Allows users to submit works, assessment	
3.3	Review form	Input page	Allows users to write a review form regarding exams and test results	
4	Profile	Information page	Displays account's information	
5	Drive	Upload page	Allows users to upload files to the school's drive	
6	My Test Bank	storage page	Used to create, store and manage users' test questions, exams	
6.1	Add questions - multiple choices		- Allows users to add questions of	
6.2	Add questions - true/false		multiple methods ( MC, T/F, open ) and store them inside My Test Bank	

6.3	Add questions - open		
6.4	View questions - multiple choices		
6.5	View questions – true/false		Allows users to view questions that were created
6.6	View questions – open		
7	E-Library	Information page	Used by the school's administrators to manage the Exam bank and is used by users to download, view and export exams from the E-library database

### 1.2. Detailed description of each page

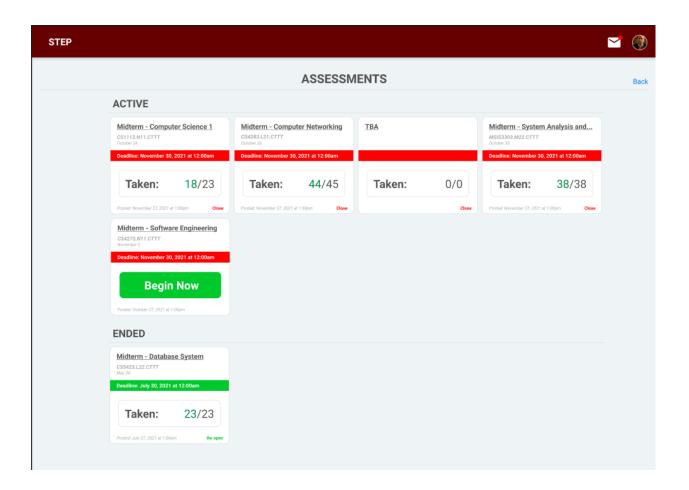
1.2.1. Dashboard Interface:



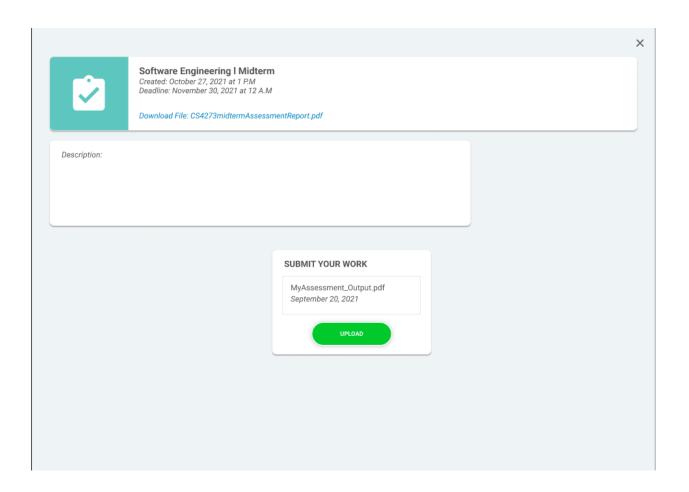
1.1.1. Log-in screen Interface:

University of Information Technology					
	Please log in to continue to the dashboard				
	Email: Password:				
	Log-in				

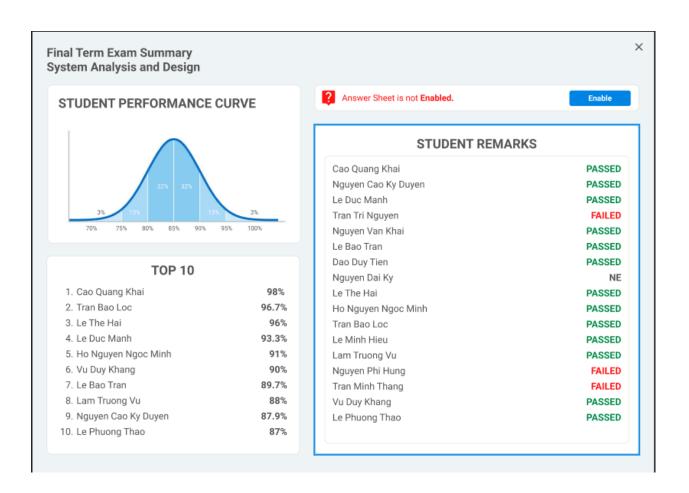
1.1.2. Assessment page Interface:



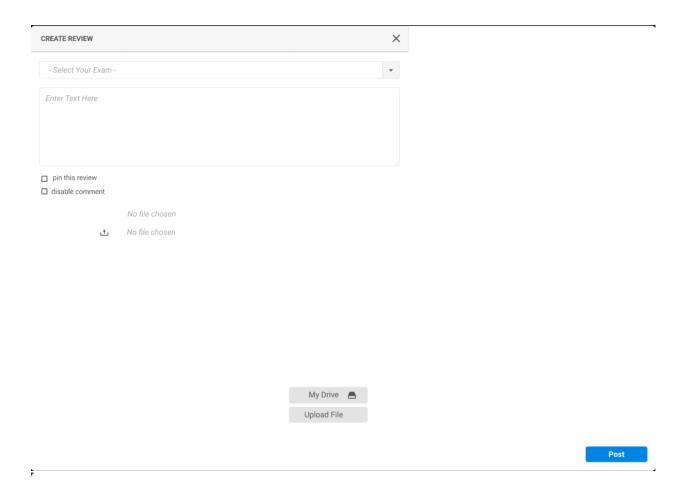
# 1.1.3. Submission Interface:

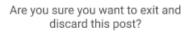


1.1.4. Exam Summary Interface:



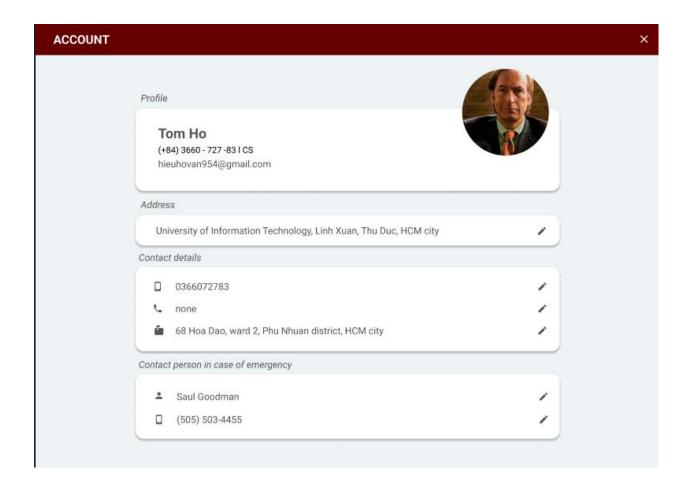
1.1.5. Review form Interface:



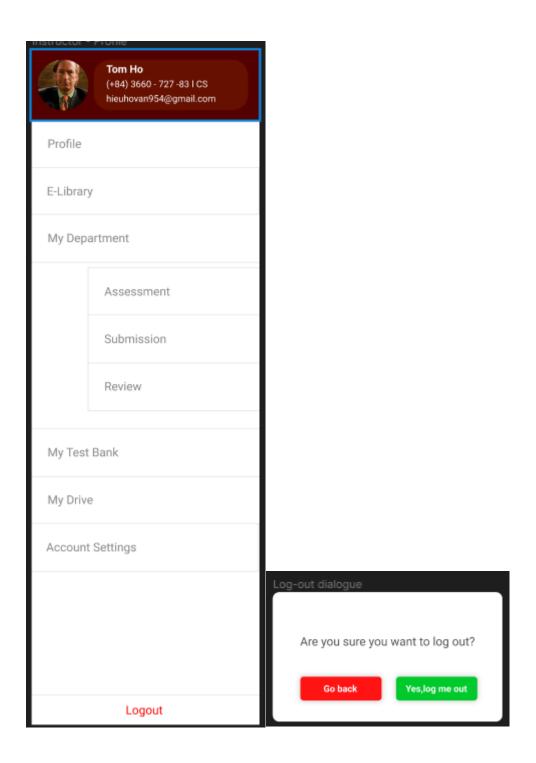




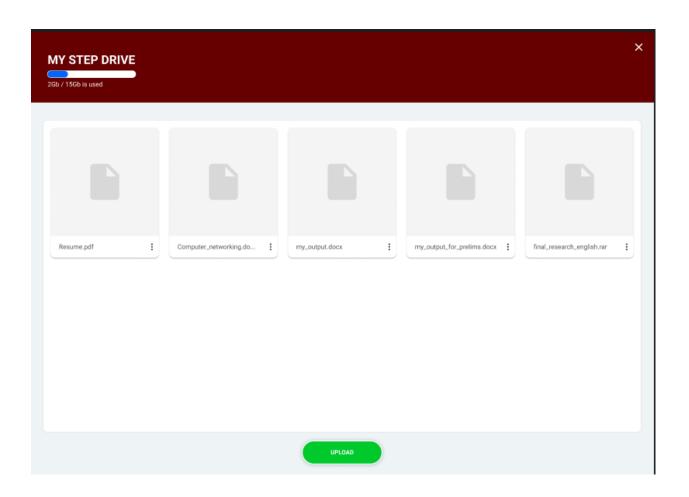
1.1.6. Profile Interface:



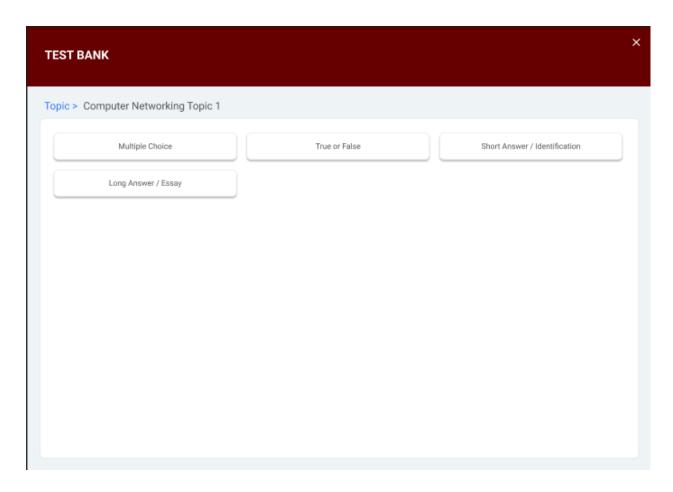
1.1.7. Sub-profile and log-out dialogue Interface:



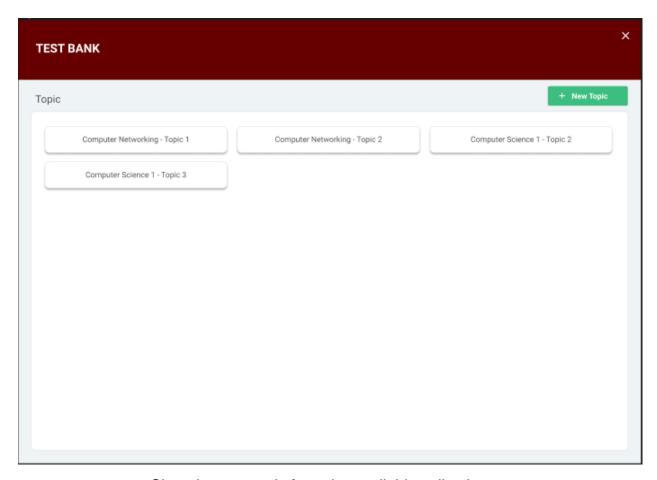
1.1.8. Drive Interface:



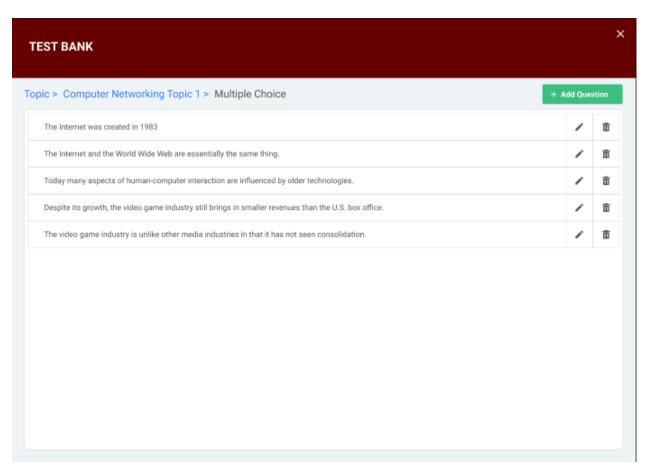
1.1.9. My Test Bank Interface:



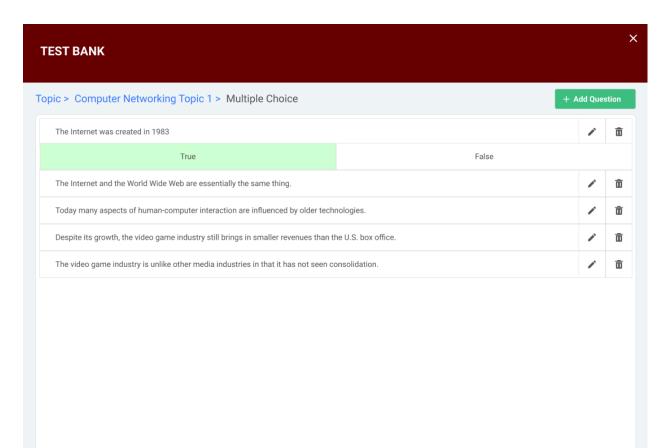
Choosing methods in My Test Bank

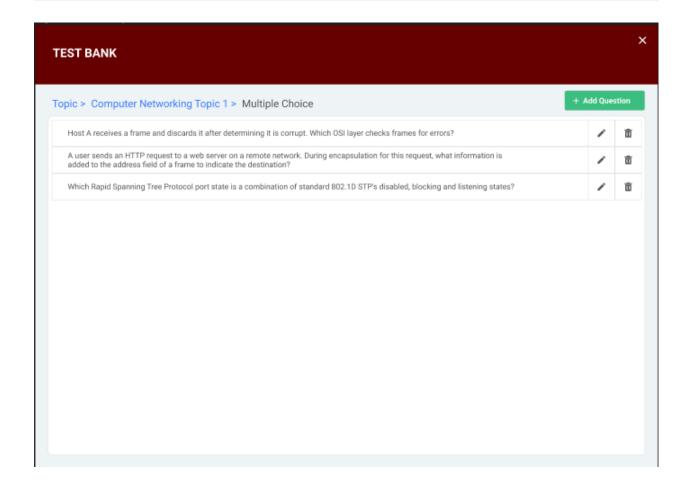


Choosing test topic from the available collection

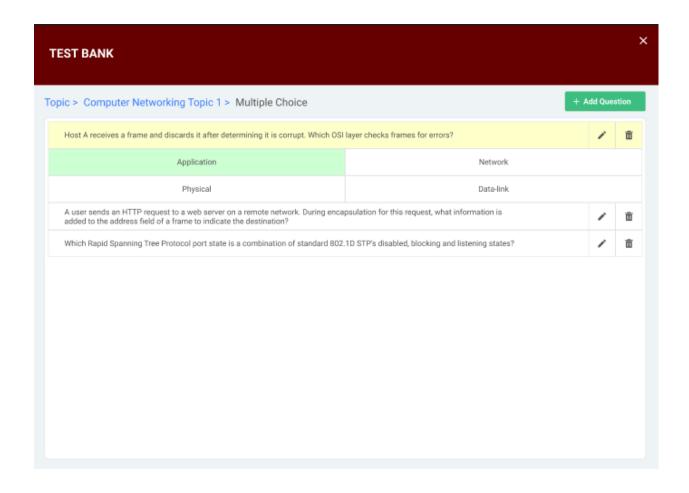


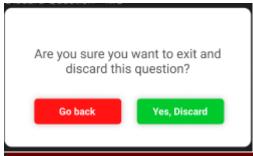
Viewing TRUE/FALSE questions to the assigned topic in My Test Bank

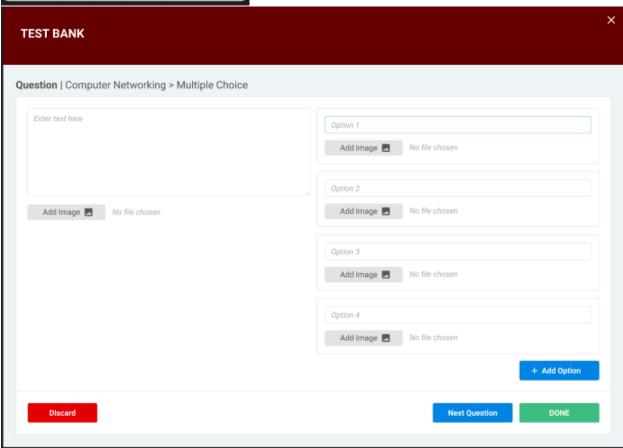




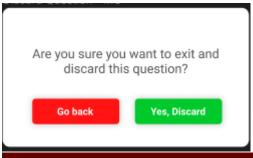
# Viewing Multiple choices questions to the assigned topic in My Test Bank

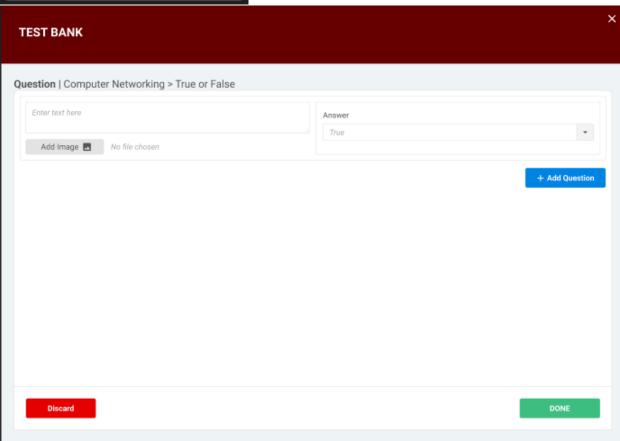






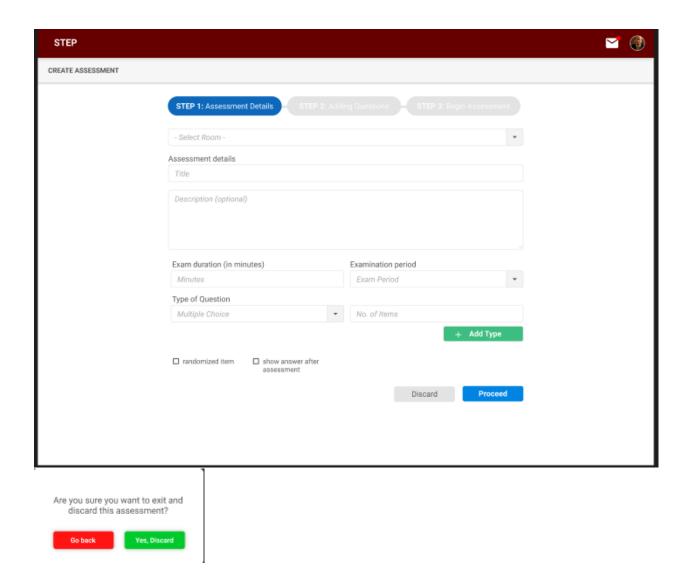
Adding Multiple choices questions to the assigned topic in My Test Bank



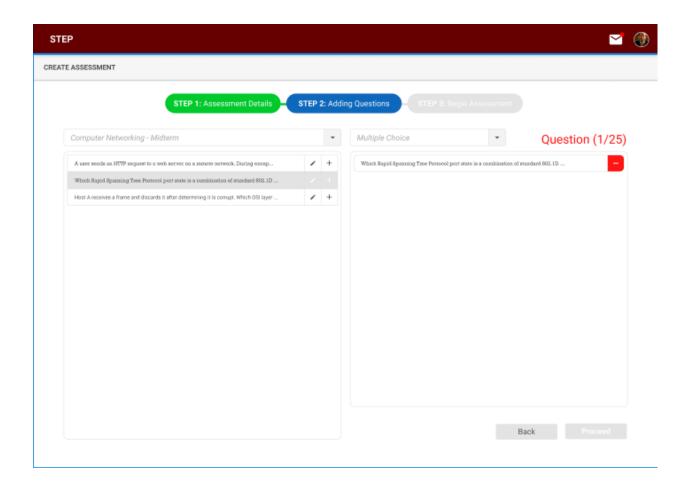


Adding TRUE/FALSE questions to the assigned topic in My Test Bank

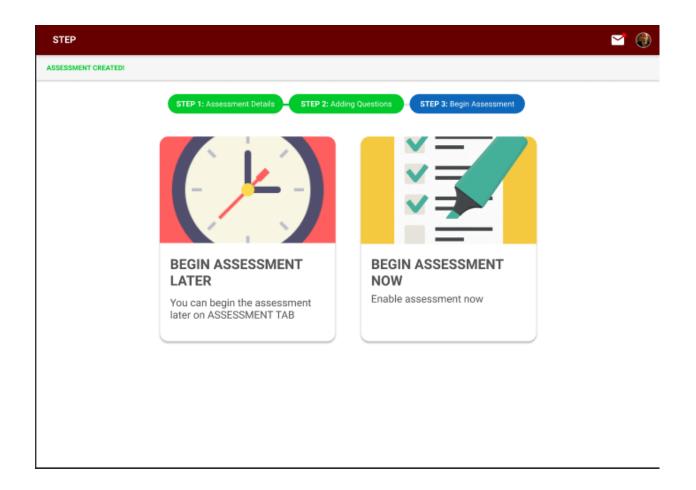
1.1.10. Create Assessment Interface:



1.1.11. Create Assessment – Adding questions Interface:



1.1.12. Create Assessment – Begin assessment Interface:



### **CHAPTER 6**

#### **SUMMARY**

1. Developing environment and executing environment

#	Requirements	Completion	Note
1	Composing test questions	100%	
2	Creating assessment	100%	
3	Grading assessment	100%	
4	Exam questions look-up	100%	
5	Annual report	0%	Not included in the
			interface

#### 2. Results

- Reliability: The system provides simple and effective exam-test
  questions storing, as well as providing users the ability to manage their
  own test bank, assessment, schedule and useful functions such as
  uploading documents, submitting works which will help users go
  through procedures faster to reduce time and labor.
- Security: The system decentralizes user level into 2 groups, with the superior group being the administrators with much more administrative authority over the system thus making it more safe and secure.

- Ease of use: The interface was designed with users in mind, providing simple but helpful, intuitive interface and it comes with sufficient, easy to use functions as well.
- The website can be run on almost all kinds of computers with a variety of platforms.

#### 3. Cons

- Test questions can only be input by hands, not from a file.
- Missing the download function for the E-library
- Test questions stored in the database can't be automatically collected to form an exam for printing.
- Grading requires teachers/lecturers to do separately from the website before uploading the results
- The results need to be manually input

#### 4. Development orientations

- Improve the interface for better navigation
- Automate functions to reduce manual tasks
- Provide users with more functions like print out a collection of test questions in a standardized form for use outside of the website, automatically valuate results input by users for assessment without having to manually input one by one