Examination_system DB

Presented to: Eng/Ramy

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Table Of Content:

1.Introduction

Digital examination systems have transformed the way academic assessments are conducted, replacing traditional, error-prone methods with a more efficient, automated approach. This Examination System streamlines the management of courses, students, instructors, and exams while automating grading and answer evaluation.
This document provides an overview of the system's database structure, including tables, relationships, and stored procedures. By enhancing accuracy, transparency, and efficiency, this system offers a seamless experience for educators and students, making it a valuable tool for modern educational institutions.

2.Use Cases

- **Student Registration and Enrollment**

    1. Students register in the system and enroll in courses.
    2. Enrollment details are stored in the Student_Courses table.

- **Exam Creation and Management**

    1. Instructors create exams using predefined questions stored in the Question table.
    2. Exams are linked to courses and instructors.
    3. The Exam_Questions table maps questions to specific exams.

- **Conducting and Submitting Exams**

    1. Students access their exams and submit answers.
    2. Their responses are recorded in the Student_Answers table.

- **Automated Grading and Evaluation**

    1. The system evaluates multiple-choice and true/false questions automatically.
    2. The stored procedure SP_Correct_Student_Answers processes and grades student responses.

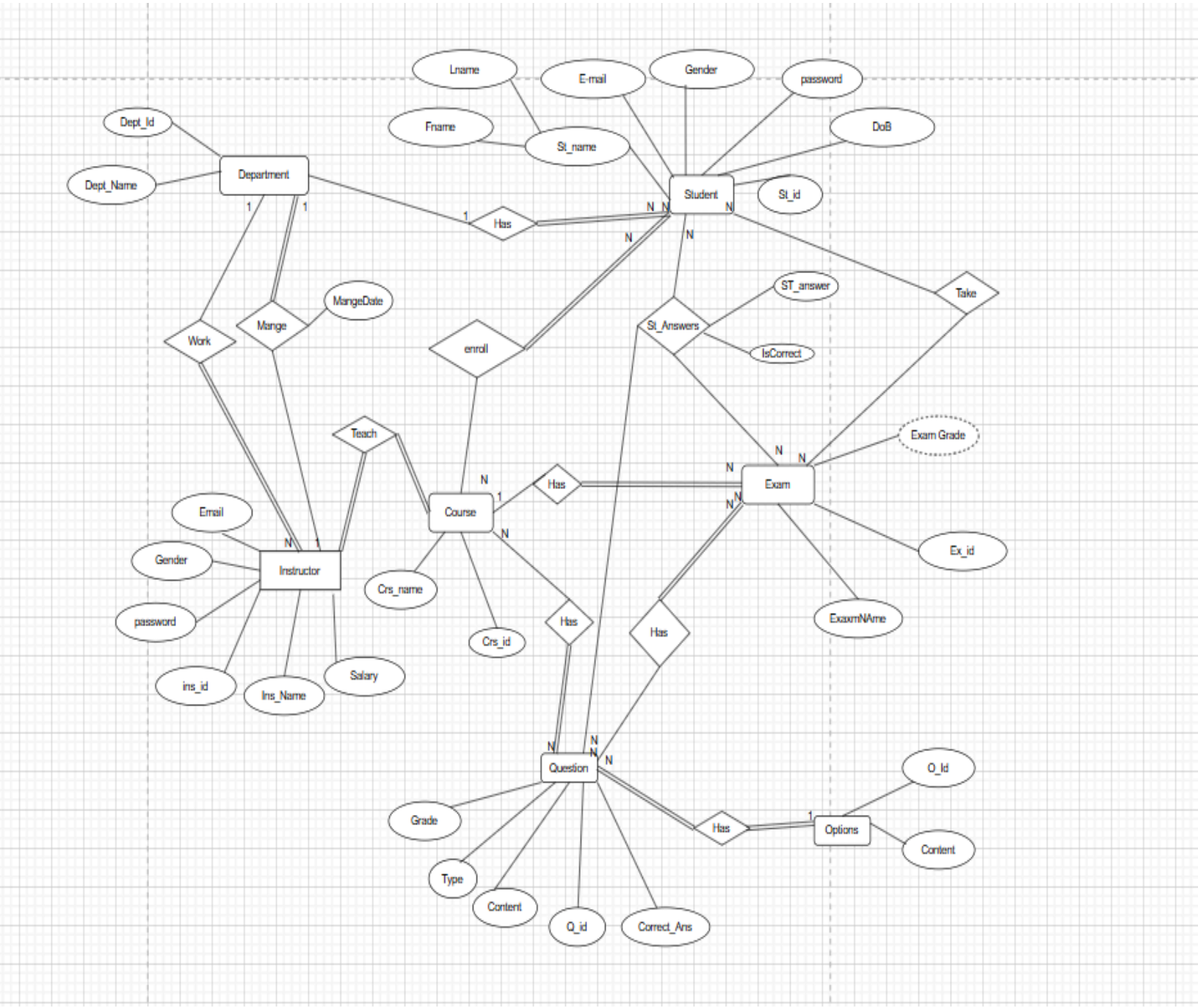
- **Instructor Management**

    1. Instructors are assigned to courses and manage question banks.
    2. The Instructor_Courses table maintains instructor-course assignments.

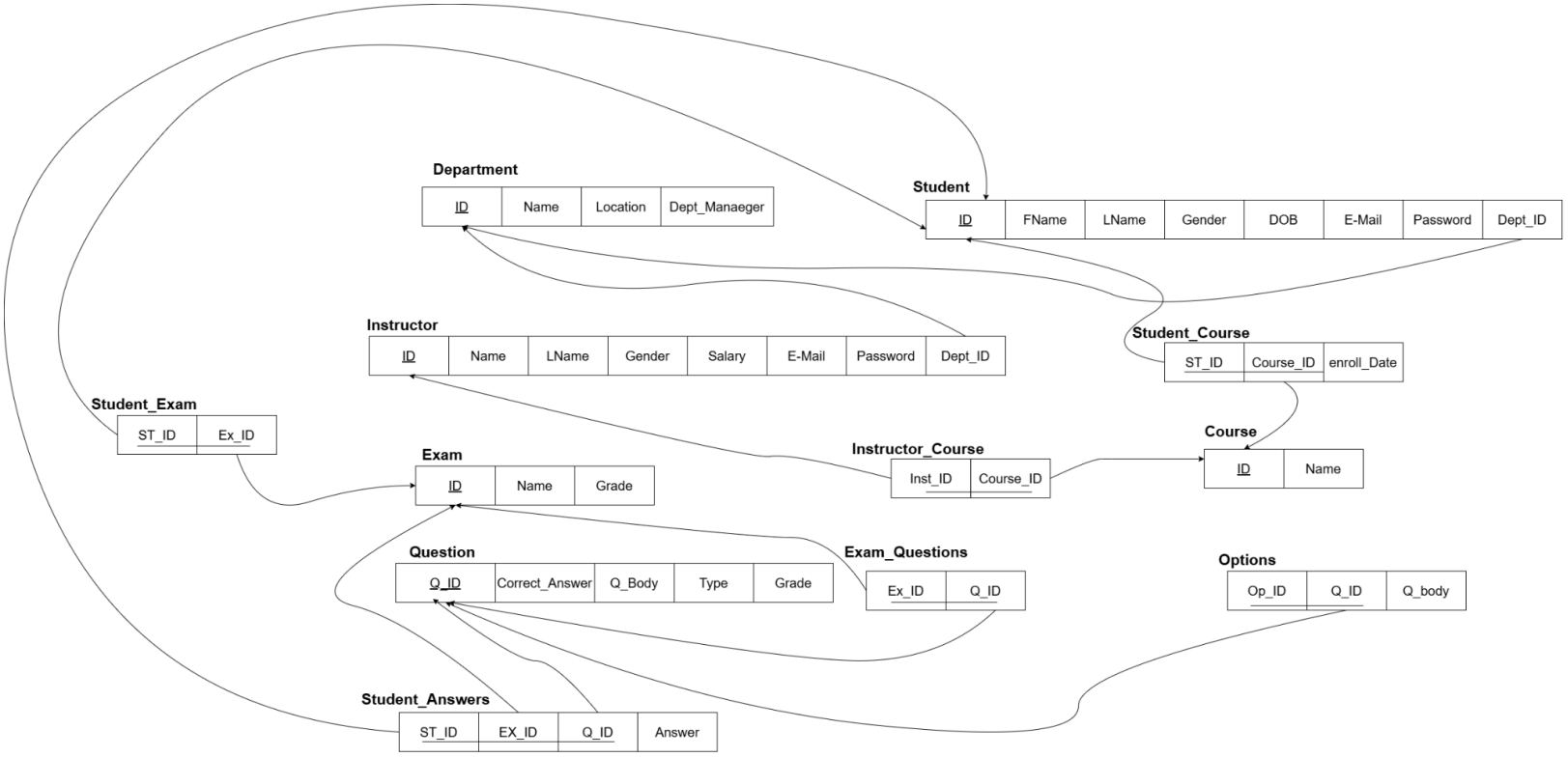
- **Student Performance Tracking**

    1. Exam results and student performance are stored in the Student_Exams table.
    2. Performance reports can be generated based on stored data.

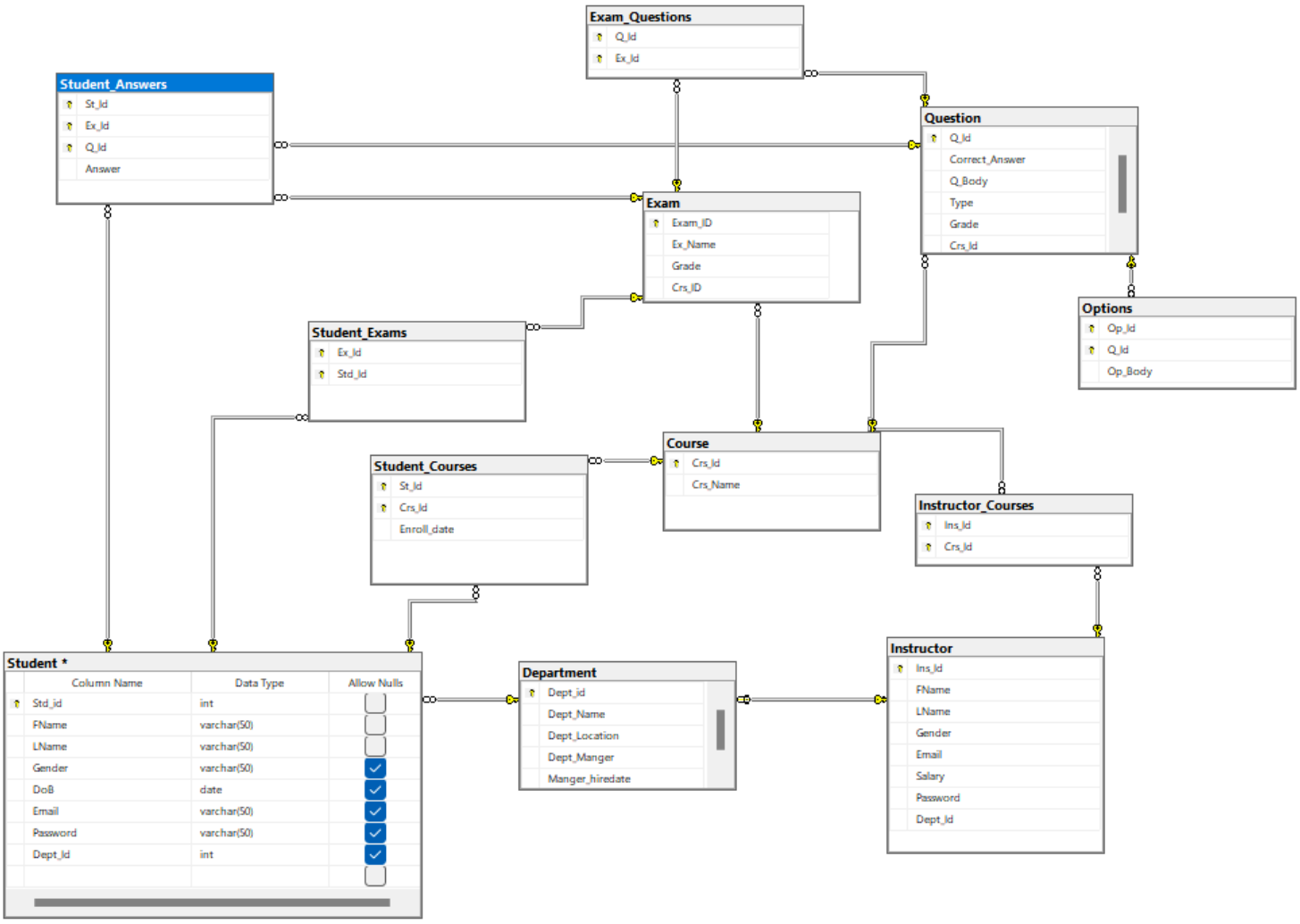
3.ER Diagram:


Lname
E-mail
Gender
password
Fname
St_name
DoB
Dept_Id
Department
Dept_Name
Student
St_id
Has
ST_answer
Take
MangeDate
Mange
St_Answers
Work
enroll
IsCorrect
Exam Grade
Teach
Exam
Email
Course
Has
Gender
Instructor
Ex_id
Crs_name
password
Has
Has
ExamNAme
Crs_id
ins_id
Ins_Name
Salary
Question
O_Id
Grade
Has
Options
Content
Type
Content
Q_id
Correct_Ans

4.Mapping


Department
ID
Name
Location
Dept_Manaeger
Student
ID
FName
LName
Gender
DOB
E-Mail
Password
Dept_ID
Instructor
ID
Name
LName
Gender
Salary
E-Mail
Password
Dept_ID
Student_Course
ST_ID
Course_ID
enroll_Date
Student_Exam
ST_ID
Ex_ID
Course
ID
Name
Instructor_Course
Inst_ID
Course_ID
Exam
ID
Name
Grade
Question
Q_ID
Correct_Answer
Q_Body
Type
Grade
Exam_Questions
Ex_ID
Q_ID
Options
Op_ID
Q_ID
Q_body
Student_Answers
ST_ID
EX_ID
Q_ID
Answer

5.Schema:


Exam_Questions
Q_Id
Ex_Id
Student_Answers
St_Id
Ex_Id
Q_Id
Answer
Question
Q_Id
Correct_Answer
Q_Body
Type
Grade
Crs_Id
Exam
Exam_ID
Ex_Name
Grade
Crs_ID
Options
Op_Id
Q_Id
Op_Body
Student_Exams
Ex_Id
Std_Id
Course
Crs_Id
Crs_Name
Student_Courses
St_Id
Crs_Id
Enroll_date
Instructor_Courses
Ins_Id
Crs_Id
Student *
Column Name
Data Type
Allow Nulls
Std_id
int
FName
varchar(50)
LName
varchar(50)
Gender
varchar(50)
DoB
date
Email
varchar(50)
Password
varchar(50)
Dept_Id
int
Department
Dept_id
Dept_Name
Dept_Location
Dept_Manger
Manger_hiredate
Instructor
Ins_Id
FName
LName
Gender
Email
Salary
Password
Dept_Id

6. Tables:

Table dbo.Course *(6 rows)*

	Column	Data Type	Identity	Nullable	Default
PK	Crs_Id	int	X		
	Crs_Name	varchar(50)		X	

Indexes:

PK_Course *(Primary Key) (Clustered)*

Crs_Id

Referenced by:

dbo.Exam *(Crs_ID -> Crs_Id)*

dbo.Instructor_Courses *(Crs_Id)*

dbo.Question *(Crs_Id)*

dbo.Student_Courses *(Crs_Id)*

Table dbo.Department *(8 rows)*

	Column	Data Type	Identity	Nullable	Default
PK	Dept_id	int	X		
	Dept_Name	varchar(50)		X	
	Dept_Location	varchar(50)		X	
FK	Dept_Manger	int		X	
	Manger_hiredate	date		X	

Indexes:

PK_Department *(Primary Key) (Clustered)*

Dept_id

References:

dbo.Instructor *(Dept_Manger -> Ins_Id)*

Referenced by:

dbo.Instructor *(Dept_Id -> Dept_id)*

dbo.Student *(Dept_Id -> Dept_id)*

Table dbo.Exam *(1 row)*

	Column	Data Type	Identity	Nullable	Default
PK	Exam_ID	int	X		
	Ex_Name	varchar(50)		X	
	Grade	int		X	
FK	Crs_ID	int		X	

Indexes:

PK_Exam *(Primary Key) (Clustered)*

Exam_ID

References:

dbo.Course *(Crs_ID -> Crs_Id)*

Referenced by:

dbo.Exam_Questions *(Ex_Id -> Exam_ID)* **dbo.Student_Answers** *(Ex_Id -> Exam_ID)* **dbo.Student_Exams** *(Ex_Id -> Exam_ID)*

Table dbo.Exam_Questions *(8 rows)*

	Column	Data Type	Identity	Nullable	Default
PK, FK	Q_Id	int			
PK, FK	Ex_Id	int			

Indexes:

PK_Exam_Questions *(Primary Key) (Clustered)*

Q_Id
Ex_Id

References:

dbo.Exam *(Ex_Id -> Exam_ID)*

dbo.Question *(Q_Id)*

Table dbo.Instructor *(5 rows)*

	Column	Data Type	Identity	Nullable	Default
PK	Ins_Id	int	X		
	FName	varchar(50)		X	
	LName	varchar(50)		X	
	Gender	varchar(50)		X	
	Email	varchar(50)		X	
	Salary	money		X	
	Password	varchar(50)		X	
FK	Dept_Id	int		X	

Indexes:

PK_Instructor *(Primary Key) (Clustered)*

Ins_Id

References:

dbo.Department *(Dept_Id -> Dept_id)*

Referenced by:

dbo.Department *(Dept_Manger -> Ins_Id)*

dbo.Instructor_Courses *(Ins_Id)*

Table dbo.Instructor_Courses *(10 rows)*

	Column	Data Type	Identity	Nullable	Default
PK, FK	Ins_Id	int			
PK, FK	Crs_Id	int			

Indexes:

PK_Instructor_Courses *(Primary Key) (Clustered)*

Ins_Id
Crs_Id

References:

dbo.Course *(Crs_Id)*

dbo.Instructor *(Ins_Id)*

Table dbo.Options *(964 rows)*

	Column	Data Type	Identity	Nullable	Default
PK	Op_Id	int			
PK, FK	Q_Id	int			
	Op_Body	varchar(100)		X	

Indexes:

PK_Options *(Primary Key) (Clustered)*

Op_Id
Q_Id

References:

dbo.Question *(Q_Id)*

Table dbo.Question *(551 rows)*

	Column	Data Type	Identity	Nullable	Default
PK	Q_Id	int	X		
	Correct_Answer	int		X	
	Q_Body	varchar(150)		X	
	Type	varchar(3)		X	
	Grade	int		X	
FK	Crs_Id	int		X	

Indexes:

PK_Question *(Primary Key) (Clustered)*

Q_Id

References:

dbo.Course *(Crs_Id)*

Referenced by:

dbo.Exam_Questions *(Q_Id)*

dbo.Options *(Q_Id)*

dbo.Student_Answers *(Q_Id)*

Table dbo.Student *(11 rows)*

	Column	Data Type	Identity	Nullable	Default
PK	Std_id	int	X		
	FName	varchar(50)			
	LName	varchar(50)			
	Gender	varchar(50)		X	
	DoB	date		X	
	Email	varchar(50)		X	
	Password	varchar(50)		X	
FK	Dept_Id	int		X	

Indexes:

PK_Student *(Primary Key) (Clustered)*

Std_id

References:

dbo.Department *(Dept_Id -> Dept_id)*

Referenced by:

dbo.Student_Answers *(St_Id -> Std_id)* **dbo.Student_Courses** *(St_Id ->*

Std_id) **dbo.Student_Exams** *(Std_Id -> Std_id)*

Table dbo.Student_Answers *(8 rows)*

	Column	Data Type	Identity	Nullable	Default
PK, FK	St_Id	int			
PK, FK	Ex_Id	int			
PK, FK	Q_Id	int			
	Answer	int		X	

Indexes:

PK_Student_Answers *(Primary Key) (Clustered)*

St_Id
Ex_Id
Q_Id

References:

dbo.Exam *(Ex_Id -> Exam_ID)*

dbo.Question *(Q_Id)* **dbo.Student** *(St_Id*

-> Std_id)

Table dbo.Student_Courses *(22 rows)*

	Column	Data Type	Identity	Nullable	Default
PK, FK	St_Id	int			
PK, FK	Crs_Id	int			

	Enroll_date	date		X	

Indexes:

PK_Student_Courses *(Primary Key) (Clustered)*

St_Id
Crs_Id

References:

dbo.Course *(Crs_Id)*

dbo.Student *(St_Id -> Std_id)*

Table dbo.Student_Exams *(0 rows)*

	Column	Data Type	Identity	Nullable	Default
PK, FK	Ex_Id	int			
PK, FK	Std_Id	int			

Indexes:

PK_Student_Exams *(Primary Key) (Clustered)*

Ex_Id
Std_Id

References:

dbo.Exam *(Ex_Id -> Exam_ID)*

dbo.Student *(Std_Id -> Std_id)*

7.Procedures:

Procedure dbo.SP_Add_MCQ_Question

Parameter	Data Type	Default	Is Output
@Q_Body	nvarchar(max)		
@Grade	int		
@Crs_Id	int		
@Option1	nvarchar(max)		
@Option2	nvarchar(max)		
@Option3	nvarchar(max)		
@Option4	nvarchar(max)		
@CorrectOption	int		

Procedure dbo.SP_Add_TF_Question

Parameter	Data Type	Default	Is Output
@Q_Body	nvarchar(max)		
@Grade	int		
@Crs_Id	int		
@CorrectOption	int		

Procedure dbo.SP_Correct_Student_Answers

Parameter	Data Type	Default	Is Output
@St_Id	int		
@Ex_Id	int		

Procedure dbo.SP_Create_Exam

Parameter	Data Type	Default	Is Output
@Ex_Name	nvarchar(255)		
@Crs_Id	int		
@Number_Of_MCQ	int		
@Number_Of_TF	int		

Procedure dbo.SP_Submit_Student_Answers

Parameter	Data Type	Default	Is Output
@St_Id	int		
@Ex_Id	int		
@Q_Id	int		
@Answer	int		

8.Conclusion

The Examination System provides a robust framework for managing academic evaluations efficiently. By integrating structured data storage and automation, it minimizes manual intervention and enhances the accuracy of assessments. This system ensures smooth exam administration, secure data handling, and effective performance tracking, making it a valuable tool for educational institutions.