

Database Management Practical Test

Entity-Relationship Diagram (ERD) Scenario

Scenario Title: University Course Registration System Background: You have been hired as a Database Designer by IT Center University to design a new Course Registration System. The system will help manage students, courses, lecturers, and enrollments efficiently. Currently, most records are kept manually, which causes problems like:

- Students enrolling in the same course twice.
- Missing lecturer information.
- Difficulty tracking which students are in which course.

Your task is to design an Entity-Relationship Diagram (ERD) that models this system accurately.

Requirements: Your ERD should represent the following details clearly:

- **Students** • Each student has a unique Student ID, Full Name, Date of Birth, Gender, Email, and Phone Number.
- A student can enroll in many courses.
- A student may have one or more payments recorded.
- **Courses** • Each course has a Course Code, Course Name, Credits, and Department.
- A course can have many students enrolled.
- Each course is taught by one lecturer.
- **Lecturers** • Each lecturer has a Lecturer ID, Full Name, Qualification, Email, and Office Number.
- A lecturer can teach many courses, but each course is taught by only one lecturer.
- **Payments** • Each payment has a Payment ID, Payment Date, Amount, and Payment Method (e.g., Cash, Card, M-Pesa).
- Each payment belongs to one student.
- A student can make multiple payments.

Tasks: 1. Identify Entities – List all entities and their key attributes. 2. Determine Relationships – Define relationships between entities and their cardinalities (e.g., one-to-many, many-to-many). 3. Create the ERD Diagram – Draw a professional ERD using proper notations (Chen or Crow's Foot notation preferred). 4. Indicate Primary and Foreign Keys – Clearly show PK (Primary Key) and FK (Foreign Key) in your diagram. Bonus Challenge (for extra marks): Add an entity for Departments: • Each department has a Department ID, Department Name, and Office Location. • Each department has many courses. • Each lecturer belongs to one department.

Section	Description	Marks
Entity Identification	Correct and complete list of entities	5
Attributes	Inclusion of all required attributes	5
Relationships	Correct relationships and cardinalities	10
Diagram Design	Clarity, accuracy, and professional notation	5
Primary/Foreign Keys	Properly identified and linked	5