Practical Assessment – Advanced SQL Concepts

Database: `university`

Tables

- `students(student_id, name, email, dept_id)`
- `departments(dept_id, dept_name)`
- `courses(course_id, course_name, dept_id)`
- `enrollments(enroll_id, student_id, course_id, grade)`

1. Indexes (5 Marks)

Q1: Create an index on the `email` column in the `students` table to improve search performance.

Q2: Explain why creating indexes on frequently searched columns is important.
Answer: Indexes speed up retrieval of records by providing a faster lookup path for queries that use the indexed columns.

2. Constraints (10 Marks)

Q3: Alter the `students` table to ensure that `email` is unique and cannot be NULL.

Q4: Add a foreign key from `students.dept_id` to `departments.dept_id`.

3. Stored Procedure (10 Marks)

Q5: Write a stored procedure named `getStudentCourses` that takes a student ID and returns all course names and grades.

4. Transactions (10 Marks)

Q6: Write a transaction that inserts a new student and enrolls them into two courses. Rollback if any step fails.

5. Triggers (10 Marks)

Q7: Create a trigger that automatically updates the grade to 'F' if a student is enrolled with a NULL grade.

Q8: Create a trigger to log every deletion from `students` into a new table