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# Daffodil International University

## Faculty of Science & Information Technology

## Department of Computer Science & Engineering

**Midterm Examination, Summer 2025**

**Course Code: CSE311, Course Title: Database Management System**

**Level: 2 Term: 3 Batch: 65**

**Time: 1:30 Hrs** **Marks: 25**

## Answer ALL Questions

***[The figures in the right margin indicate the full marks and corresponding course outcomes. All portions of each question must be answered sequentially.]***

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| **1.** | | You are tasked with maintaining a database. The tasks include:<br>Dropping obsolete columns from a table,<br>Deleting outdated records based on a date condition, and<br>Assigning new user roles with specific permissions.<br>Classify each of these operations as DDL, DML, or DCL commands. Describe how executing each affects database structure, data integrity, and access control.<br><br>**Classify** each of these operations as DDL, DML, or DCL commands. Describe how executing each affects database structure, data integrity, and access control. | [5] | CO 1 |
| **2** | a) | During the COVID-19 pandemic, the Bangladesh government established a system to track vaccinations and testing across the country. Each citizen is registered with a unique National ID number and has a full name divided into first, middle, and last names, multiple contact phone numbers, and an address containing village, post office, and district.<br>Citizens can register at multiple vaccination centers, each with a unique center code, name, and location. Each vaccination center offers different vaccine types, identified by a vaccine code and name.<br>Citizens receive multiple vaccine doses; each dose record includes the date administered and the batch number. Some citizens also undergo COVID-19 tests at various testing centers, which have unique IDs, names, and locations. Each test has a test ID, date conducted, and test result.<br>Citizens may report multiple COVID-related symptoms during follow-up calls. Each symptom record includes the symptom name and severity level. For emergency contact, each citizen provides contacts with full names, multiple phone numbers, and relation to the citizen.<br>Healthcare workers assigned to vaccination and testing centers are identified by employee IDs, names, and roles. Some healthcare workers supervise centers, and each center must have exactly one supervisor.<br><br>The government also tracks quarantine facilities, each with a unique ID, location, and capacity. Citizens may be assigned to quarantine for specific periods.<br><br>Using the scenario, **construct** an ER diagram and then a schema diagram showing entities, attributes (including composite and multivalued), keys, all | [7] | CO 1 |

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| | | relationship types with cardinalities, weak entities, and participation constraints. | | |
| | b) | **Construct Relational Algebra to retrieve the required information from the given schema.**<br>**Students**(student_id, name, age)<br>**Enrollments**(student_id, course_id, grade)<br><br>I. Find the names of students who are older than 20.<br>II. Find the course IDs of all courses where students have received a grade of 'A'.<br>III. List all student names along with the course IDs they are enrolled.<br>IV. Identify the students who have enrolled in every course offered in the system.<br>V. Find all students and their grades specifically for the course with course_id = 'CSE101' . | [5] | CO 1 |
| 3. | a) | Construct SQL queries to retrieve the required information from the given schema.<br>**Employees** (emp_id, name, department_id, salary, age)<br>**Departments** (department_id, department_name, location)<br>**Projects** (project_id, project_name, department_id, budget)<br><br>I. Find the names of employees who work in departments located in Dhaka.<br><br>II. List the departments where the total budget of all projects exceeds 250,000.<br><br>III. Retrieve the names of employees whose salary is higher than the average salary of their respective departments.<br><br>IV. Find the names of employees who work in departments that have at least one project with a budget less than 130,000.<br><br>V. List employees who work in departments where every project has a budget greater than 100,000 | [8] | CO 2 |