### Tables and Entity Relationship Breakdown

### Tables:

#### Roles Table:

* **roleID**
* **roleName**

#### Campus Table:

* **campusID**
* **campusName**

#### Users Table:

* **userID**
* **userCode**
* **username**
* **eMail**
* **password**
* **roleID**
* **campusID**
* **isActive(checks if the user is active)**

#### Subjects Table:

* **subjectID**
* **subjectCode**
* **subjectName**

#### Faculty\_Subjects Table:

* **facultySubjectsID**
* **facultyCode**
* **subjectCode**

#### Questionnaires Table:

* **questionnaireID**
* **title**
* **subjectCode**
* **createdBy**
* **status**
* **coverage**
* **difficulty**
* **printable** (BOOLEAN)
* **printID** (Optional)

#### Questions Table:

* **questionID**
* **questionnaireID**
* **questionText**
* **imagePath**
* **status**
* **score**

#### Exams Table:

* **examID**
* **studentCode**
* **subjectCode**
* **type**
* **score**

#### Exam Questions Table:

* **examQuestionID**
* **examID**
* **questionID**
* **choiceID**
* **isCorrect**

#### Choices Table:

* **choiceID**
* **questionID**
* **imagePath**
* **choiceText**
* **isCorrect**

#### Exam Settings Table:

* **examSettingsID**
* **createdBy**
* **examType**
* **difficulty**

#### Exam Subject Distribution Table:

* **examSubjectDistributionID**
* **examSettingsID**
* **subjectCode**
* **percentage**

#### Difficulty Distribution Table:

* **difficultyDistributionID**
* **examSubjectDistributionID**
* **easyPercentage**
* **moderatePercentage**
* **hardPercentage**

#### Requests Table:

* **printPermissionID**
* **userCode**
* **questionnaireID**

#### Print Table (Optional):

* **printID**
* **questionnaireID**
* **userCode**

#### Practice Settings Table:

* **settingsID**
* **studentCode**
* **subjectCode**
* **timerEnabled**
* **difficultyDistribution**

#### Notifications Table:

* **notificationID**
* **userCode**
* **message**
* **type**
* **isRead**
* **sentAt** (TIME)

### Entity Relationship Breakdown:

#### 1. Campus & Users:

* **campus** ⬌ **users**
  + **1-to-Many**
  + A campus can have multiple users.
  + **FK:** users.campusID → campus.campusID

#### 1. Roles & Users:

* **roles** ⬌ **users**
  + **1-to-Many**
  + A role can be assigned to many users.
  + **FK:** users.roleID → roles.roleID

#### 2. Subjects & Faculty Assignments:

* **subjects** ⬌ **faculty\_subjects** ⬌ **users (Faculty)**
  + **Many-to-Many** relationship facilitated by **faculty\_subjects**.

**Relationships:**

* + **faculty\_subjects → subjects**
    - **Many-to-1**: A faculty\_subject entry links to one subject.
    - **FK:** faculty\_subjects.subjectCode → subjects.subjectCode
  + **faculty\_subjects → users (Faculty)**
    - **Many-to-1**: A faculty\_subject entry links to one faculty member.
    - **FK:** faculty\_subjects.facultyCode → users.userCode

#### 3. Questionnaires & Questions:

* **subjects** ⬌ **questionnaires**
  + **1-to-Many**
  + Each subject can have multiple questionnaires.
  + **FK:** questionnaires.subjectCode → subjects.subjectCode
* **users (Faculty/Program Chair/Dean)** ⬌ **questionnaires**
  + **1-to-Many**
  + A user can create multiple questionnaires.
  + **FK:** questionnaires.createdBy → users.userID
* **questionnaires** ⬌ **questions**
  + **1-to-Many**
  + A questionnaire contains multiple questions.
  + **FK:** questions.questionnaireID → questionnaires.questionnaireID
* **questions** ⬌ **choices**
  + **1-to-Many**
  + A question has multiple choices.
  + **FK:** choices.questionID → questions.questionID

#### 4. Exams & Practice Sessions:

* **users (Students)** ⬌ **exams**
  + **1-to-Many**
  + A student can take multiple exams.
  + **FK:** exams.studentCode → users.userCode
* **subjects** ⬌ **exams**
  + **1-to-Many**
  + Each exam is linked to one subject.
  + **FK:** exams.subjectCode → subjects.subjectCode
* **exams** ⬌ **exam\_questions**
  + **1-to-Many**
  + Each exam contains multiple exam questions.
  + **FK:** exam\_questions.examID → exams.examID
* **exam\_questions** ⬌ **questions**
  + **1-to-1**
  + Each exam question maps to a specific question from the question bank.
  + **FK:** exam\_questions.questionID → questions.questionID
* **exam\_questions** ⬌ **choices**
  + **1-to-1**
  + Tracks the selected choice for each exam question.
  + **FK:** exam\_questions.choiceID → choices.choiceID

#### 5. Exam Configuration & Difficulty:

* **users (Program Chair/Dean)** ⬌ **exam\_settings**
  + **1-to-Many**
  + Users can create multiple exam configurations (qualifying, practice, individual).
  + **FK:** exam\_settings.createdBy → users.userID
* **exam\_settings** ⬌ **exam\_subject\_distribution**
  + **1-to-Many**
  + An exam setting can include multiple subjects with specific percentages.
  + **FK:** exam\_subject\_distribution.examSettingsID → exam\_settings.examSettingsID
* **exam\_subject\_distribution** ⬌ **subjects**
  + **Many-to-1**
  + Each distribution entry links to one subject.
  + **FK:** exam\_subject\_distribution.subjectCode → subjects.subjectCode
* **exam\_subject\_distribution** ⬌ **difficulty\_distribution**
  + **1-to-1**
  + Each subject distribution has a difficulty breakdown.
  + **FK:** difficulty\_distribution.examSubjectDistributionID → exam\_subject\_distribution.examSubjectDistributionID

#### 6. Approval & Printing System:

* **users (Instructors)** ⬌ **requests**
  + **1-to-Many**
  + Instructors submit approval requests for questionnaires.
  + **FK:** requests.userCode → users.userCode
* **users (Program Chair/Dean)** ⬌ **print\_permissions**
  + **1-to-Many**
  + Tracks which users can print which questionnaires.
  + **FK:** print\_permissions.requestedBy → users.userCode
  + **FK:** print\_permissions.approvedBy → users.userCode

#### 7. Practice Settings & Notifications:

* **users (Students)** ⬌ **practice\_settings**
  + **1-to-1**
  + Each student has custom practice settings.
  + **FK:** practice\_settings.studentCode → users.userCode
* **subjects** ⬌ **practice\_settings**
  + **1-to-1**
  + Practice settings are tied to one subject (single-subject rule).
  + **FK:** practice\_settings.subjectCode → subjects.subjectCode
* **users** ⬌ **notifications**
  + **1-to-Many**
  + Users can receive multiple notifications (e.g., approvals, exam schedules).
  + **FK:** notifications.userCode → users.userCode