ER Modelling Exercise - SMCSE

The School of Mathematics, Computer Science and Engineering is composed of several departments. Each department is identified by a code, has a departmental office (office number) and a departmental administrator (administrator name). Each department has teaching staffs that teach modules. Each teaching staff member has a staff number, a name, and a salary. Teaching staff are either Academics or Teaching Assistants. Academics have grades, while Teaching Assistants have contracts (Contract Number). Most Academics are responsible for one or more modules (module number, module name, topic), and a module is the responsibility of only one Academic. Teaching Assistants must assist with teaching one or more modules. Module can have several Teaching Assistants. In each department, one of the Academics acts as the Head of Department, and they have a special responsibility allowance.

Design an E-R diagram for the above database. Derive a corresponding relational scheme from your E-R diagram.

Entities and Attributes:

Department:

DeptCode (Primary Key)

OfficeNumber

AdministratorName

Teaching Staff:

StaffNumber (Primary Key)

Name

Salary

Academics (Subtype of Teaching Staff):

Grade

Teaching Assistants (Subtype of Teaching Staff):

ContractNumber

Module:

ModuleNumber (Primary Key)

ModuleName

Topic

Relationships:

Teaching Staff Works in Department:

Cardinality: One department has many staff members (Academics and Teaching Assistants), but each staff member belongs to only one department.

Type: 1-to-Many (One department, many staff members)

Head of Department (Academic):

Cardinality: One department has one Head of Department (who is an Academic), and an Academic can be Head of only one department.

Type: 1-to-1 (One department, one head)

Academics Teach Modules:

Cardinality: An Academic can teach one or more modules, but each module is taught by only one Academic.

Type: 1-to-Many (One Academic, many modules)

Teaching Assistants Assist with Modules:

Cardinality: A Teaching Assistant can assist with multiple modules, and each module can have multiple Teaching Assistants.

Type: Many-to-Many (Many Teaching Assistants, many modules)