**Course Code: IS212**

**Course Name: Databases**

**2nd year**

**Bioinformatics Program**

**May 2021**

**Faculty of Computer and Information**

**Assiut University**

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**Sheet # 3 - (Enhanced Entity Relationship Model) -**

**1.** Consider the following information about a university database:

* Professors have an SSN, a name, an age, a rank, and a research specialty.
* Projects have a project number, a sponsor name (e.g., NSF), a starting date, an ending date, and a budget.
* Graduate students have an SSN, a name, an age, and a degree program (e.g., M.S. or Ph.D.).
* Each project is managed by one professor (known as the project's principal investigator).
* Each project is worked on by one or more professors (known as the project's co-investigators).
* Professors can manage and/or work on multiple projects.
* Each project is worked on by one or more graduate students (known as the project's research assistants).
* When graduate students work on a project, a professor must supervise their work on the project. Graduate students can work on multiple projects, in which case they will have a (potentially different) supervisor for each one.
* Departments have a department number, a department name, and a main office.
* Departments have a professor (known as the chairman) who runs the department.
* Professor’s work in one or more departments and for each department that they work in, a time percentage is associated with their job.
* Graduate students have one major department in which they are working on their degree.
* Each graduate student has another, more senior graduate student (known as a student advisor) who advises him or her on what courses to take.

**Design and draw an EER diagram that captures the information about the university**

**2- Translate the following EER diagram to a relational schema.**

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3- ABC Band is an orchestra that plays different types of concerts. The orchestra’s popularity is growing fast and they are starting to have problems to keep track of the musicians that should play in each concert as well as the musical works that are most suitable for the concert. Help the orchestra to create a database model, as a first step to implement a database, so that the orchestra can keep track of both musicians and musical works. The database model must represent the following points:

* The orchestra plays three types of concerts: church concerts, private parties, and outdoor concerts.
* The orchestra plays three types of music: classical, swedish folk, and german folk. The orchestra always plays classical music in their church concerts. The orchestra always plays german folk on private parties. Finally, the orchestra plays a blend of the three types of music when playing outdoor.
* It should be possible to find in the database the music works that are suitable for each type of concert so that the repertoire can be easily planned well in advance.
* For each musical work, the database should store which musical setting (i.e. the instruments) are required to play the work.
* The database should store information for each coming concert. The information should include the place, date and time of the concert as well as the type of concert and the repertoire that will be played.
* For each musician in the orchestra, the database should store his/her name, the instrument that he/she plays, and in which of the coming concerts he/she will participate.

**Draw an EER diagram for the orchestra’s database.**