Q2.1 What is the purpose of ER modeling?

ER modeling is a conceptual database modeling method. It enables the structuring and organizing of the requirements collection process and provides a way to graphically represent the requirements.

Q2.2 What are the basic ER modeling constructs?

Entities (with their attributes) and relationships.

Q2.3 What is a unique attribute?

An attribute whose value is different for each entity instance.

Q2.4 What is depicted by cardinality constraints?

Cardinality constraints depict how many instances of one entity can be associated with instances of another entity

Q2.5 What are the four possible cardinality constraints?

• Mandatory Many

• Optional Many

• Mandatory One

• Optional One

Q2.6 What are the three types of relationships (maximum cardinality-wise)?

• One-to-one relationship (1:1)

• One-to-many relationship (1:M)

• Many-to-many relationship (M:N)

Q2.7 What is a composite attribute?

An attribute that is composed of several attributes.

Q2.8 What are candidate keys?

Multiple unique attributes of the same entity.

Q2.9 What is a multivalued attribute?

An attribute for which instances of an entity can have multiple values.

Q2.10 What is a derived attribute?

An attribute whose value will not be permanently stored in a database.

Q2.11 What is an optional attribute?

An attribute that is allowed to not have a value

Q2.12 How are exact minimum and maximum cardinalities depicted in a relationship?

By pairs of numbers in parentheses placed on the relationship lines. The number closest to the open parenthesis indicates minimum cardinality. The second number, the number closest to the closed parenthesis, indicates maximum cardinality.

Q2.13 What is a binary relationship?

A relationship that involves two entities.

Q2.14 What is a unary relationship?

A relationship involving one entity in a relationship with itself.

Q2.15 What is a weak entity?

A construct in an ER diagram used to depict entities that do not have a unique attribute of their own.

Q2.16 What is an associative entity?

An ER diagram construct used as an alternative way of depicting M:N relationships.

Q2.17 What is a ternary relationship?

A relationship involving three entities

MC5 ExoProtect Employees’ Computers Database will keep track of the following:

- For each computer we will keep track of a computer ID (unique), the computer make and the computer model.

- For each employee we will keep track of an employee identifier (unique), an employee name and multiple employee skills.

- For each software package we will keep track of a software package ID (unique), and software package name.

- Each computer is assigned to exactly one employee. An employee can have zero or one computer assigned to him or her.

- Each computer is maintained by exactly one employee. An employee can maintain multiple computers, but they do not have to maintain any.

- Each employee can be certified to use multiple software packages, but they do not have to be certified to use any. Each software package must be certified for use by at least one employee, but it can have many employees certified for its use.

- Each computer can have several software packages installed on it, but it does not have to have any installed. Every software package must be installed on one computer, but it can be installed on many. For every instance of a software package installed we will keep track of the date of the installation.

- For each software package we will keep track of number of installations.

MC6 Jones Dozers Sales and Rentals Database will keep track of the following:

- For each piece of equipment we will keep track of the equipment unique serial number, date the equipment was made and the last inspection date.

- For each equipment detail we will keep track of a unique equipment detail identifier, the equipment detail make, model, and type.

- For each customer we will keep track of the unique customer identifier, the customer name, and the customer category.

- For each sales rep we will keep track of a unique sales rep identifier, the sales rep name which will be composed of a first and last name, and the sales rep rank.

- For each rental we will keep track of a unique rental transaction identifier, date of the rental, and the total price of the rental.

- For each sale we will keep track of the unique sales transaction identifier, the sale date and the sale price.

- Each piece of equipment has one equipment detail. Each equipment details applies to at least one piece of equipment, but can apply to many.

- Each rental involves one piece of equipment. Each piece of equipment can be rented many times, but it does not have to be rented at all.

- Each customer can be involved with many rentals, but they do not have to have any rentals. Each rental involves one customer.

- Each sales rep can conduct many rentals, but they do not have to conduct any. Each rental must be conducted by exactly one sales rep.

- Each sale involves one piece of equipment. Each piece of equipment can be involved in one sale, but it does not have to be involved in any.

- Each customer can take part in many sales, but they do not have to take part in any. Each sale must have exactly one customer.

- Each sales rep can conduct many sales, but they do not have to conduct any. Each sale must be conducted by exactly one sales rep.

- A sales rep can mentor up to three other sales reps, but they do not have to mentor any. Each sales rep can be mentored by one other sales rep, or they are not mentored by any.