SRM INSTITUTE OF SCIENCE AND TECHNOLOGY

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

UNIT-2
QUESTION BANK

SUBJECT : Subject Code: 18CSC303J- Database Management Systems

SEM/YEAR: VI/III

Course Outcomes

CO2:Apply the fundamentals of data models to model an application's data requirements using conceptual modeling tools like ER diagrams

Q. No.	Questions	Course Outcome	CompetenceBT Level
1	A relational database consists of a collection of A. Tables B. Fields C. Records D. Keys	CO2	BT1
2	A_____in a table represents a relationship among a set of values. A. Column B. Key C. Row D. Entry	CO2	BT2

3	The term attribute refers to a_____of a table. A. Record B. Column C. Tuple D. Key	CO2	BT1
4	A_____is a set of entities of the same type that share the same properties, or attributes. A. Entity set B. Attribute set C. Relation set D. Entity model	CO2	BT1
5	The attribute name could be structured as an attribute consisting of first name, middle initial, and last name. This type of attribute is called A. Simple attribute B. Composite attribute C. Multivalued attribute D. Derived attribute	CO2	BT1
6	The attribute AGE is calculated from DATE_OF_BIRTH. The attribute AGE is A. Single valued B. Multi valued C. Composite D. Derived	CO2	BT1

7	In a relation between the entities the type and condition of the relation should be specified. That is called as_____attribute. A. Descriptive B. Derived C. Recursive D. Relative	CO2	BT2
8	An entity in A is associated with at most one entity in B, and an entity in B is associated with at most one entity in A. This is called as A. One-to-many B. One-to-one C. Many-to-many D. Many-to-one	CO2	BT3
9	An entity in A is associated with at most one entity in B. An entity in B, however, can be associated with any number (zero or more) of entities in A. A. One-to-many B. One-to-one C. Many-to-many D. Many-to-one	CO2	BT1
10	Which of the following can be addressed by enforcing a referential integrity constraint? A. All phone numbers must include the area code B. Certain fields are required (such as the email address, or phone number) before the record is accepted C. Information on the customer must be known before anything can be sold to that customer D. Then entering an order quantity, the user must input a number and not some text (i.e., 12 rather than 'a dozen')	CO2	BT1

11	_____is a special type of integrity constraint that relates two relations & maintains consistency across the relations. A. Entity Integrity Constraints B. Referential Integrity Constraints C. Domain Integrity Constraints D. Domain Constraints	CO2	BT1
12	Which one of the following uniquely identifies the elements in the relation? A. Secondary Key B. Primary key C. Foreign key D. Composite key	CO2	BT2
13	_____is preferred method for enforcing data integrity A. Constraints B. Stored Procedure C. Triggers D. Cursors	CO2	BT1
14	Let us consider phone - number, which can take single or several values. Treating phone - number as a_____permits instructors to have several phone numbers (including zero) associated with them. A. Entity B. Attribute C. Relation D. Value	CO2	BT1

15	Given the basic ER and relational models, which of the following is INCORRECT? A. An attribute of an entity can have more than one value B. An attribute of an entity can be composite C. In a row of a relational table, an attribute can have more than one value D. In a row of a relational table, an attribute can have exactly one value or a NULL value	CO2	BT1
16	In E-R diagram generalization is represented by A. Ellipse B. Dashed ellipse C. Rectangle D. Triangle	CO2	BT1
17	What is a relationship called when it is maintained between two entities? A. Unary B. Binary C. Ternary D. Quaternary	CO2	BT1
18	A primary key is combined with a foreign key creates A. Parent-Child relationship between the tables that connect them B. Many to many relationship between the tables that connect them C. Network model between the tables that connect them D. An attribute of an entity can be composite	CO2	BT1

19	There are similarities between the instructor entity set and the secretary entity set in the sense that they have several attributes that are conceptually the same across the two entity sets: namely, the identifier, name, and salary attributes. This process is called A. Commonality B. Specialization C. Generalization D. Similarity	CO2	BT1
20	Consider the employee work-team example, and assume that certain employees participate in more than one work team. A given employee may therefore appear in more than one of the team entity sets that are lower level entity sets of employee. Thus, the generalization is _____ A. Overlapping B. Disjointness C. Uniqueness D. Relational	CO2	BT1
21	The completeness constraint may be one of the following: Total generalization or specialization, Partial generalization or specialization. Which is the default? A. Total B. Partial C. Should be specified D. cannot be determined	CO2	BT1

22	The_____operation allows the combining of two relations by merging pairs of tuples, one from each relation, into a single tuple. A. Select B. Join C. Union D. Intersection	CO2	BT1
23	The_____operation performs a set union of two "similarly structured" tables A. Union B. Join C. Product D. Intersect	CO2	BT1
24	Which of the following is another name for a weak entity? A. Child B. Owner C. Dominant D. Parent	CO2	BT1
25	The subset of a super key is a candidate key under what condition? A. No proper subset is a super key B. All subsets are super keys C. Subset is a super key D. Each subset is a super key	CO2	BT1

26	In a relational model, relations are termed as A. Tuples. B. Attributes C. Tables. D. Rows.	CO2	BT1
27	In an E-R diagram an entity set is represent by a A. Rectangle. B. Ellipse. C. Diamond box. D. Circle.	CO2	BT1
28	The relational model feature is that there A. Is no need for primary key data. B. Is much more data independence than some other database models. C. Are explicit relationships among records. D. Are tables with many dimensions.	CO2	BT1
29	What is a relationship called when it is maintained between two entities? A. Unary B. Binary C. Ternary D. Quaternary	CO2	BT1
30	Degree of ternary relationship is_____ A. 2 B. 4 C. 5 D. 3	CO2	BT1

31	Let us consider first name, middle initial, and last name as a subparts of name attribute, then Name is a _____ attribute A. Simple B. Composite C. Single D. Derived	CO2	BT1
32	An entity set which does not have any key attributes is called as a A. Strong entity set B. weak entity set C. partially Strong entity set D. partially weak entity set	CO2	BT1
33	The_____relationship may also be referred to as a superclass-subclass relationship. A. Generalization B. Partialization C. Specialization D. Aggregation	CO2	BT1
34	Consider a relation student course details with attributes rno, sname, semester, subjects and rno. be the primary key subjects in this relation can be_____attribute A. Single B. Simple C. Composite D. Multivalued	CO2	BT1
35	Which of the following is not valid in case of ER diagram creation. A. Identify all the entities in the system. B. Identify relationships between entities C. Add attributes for entities D. Remove attributes for entities	CO2	BT1

36	_____relationship involves the same entity type more than once A. Recursive B. Many to many C. One to many D. Many to one	CO2	BT3
37	_____key identifies the tuples uniquely in relation. A. Primary key B. Super key C. Candidate key D. None of these	CO2	BT3
38	Relations obtained from an E-R model will always be in _____normal form A. Fourth B. Third C. BCNF D. First	CO2	BT2
39	E-R modeling technique is a: A. Top-down approach B. Bottom-up approach C. Left-right approach D. Right- Left approach	CO2	BT2
40	_____is a bottom-up approach in which two lower level entities combine to form a higher level entity. A. Specialization B. Aggregation C. Initialisation D. Generalization	CO2	BT2

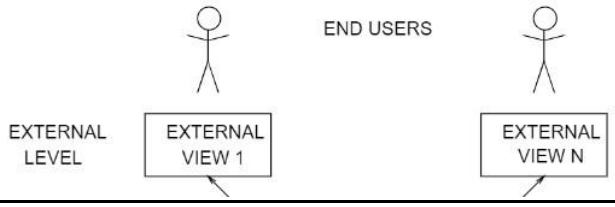
41	_____key is a candidate key not used for primary key A. Alternate B. Foreign C. Super D. Unique	CO2	BT2
42	Which of the following commands is used to get all the columns in a table? A. # B. * C. % D. @	CO2	BT3
43	The set of permitted values for each attribute is called its : A. Attribute set B. Attribute range C. Domain D. Group	CO2	BT3
44	_____key provides the basic tuple-level addressing mechanism in a relational System A. Unique B. Alternative C. Candidate D. Primary	CO2	BT2
45	The_____of Primary keys of the related entity sets becomes a Super Key of the relation. A. Union B. Intersection C. Minus D. Aggregation	CO2	BT2

46	Which of the following is not a set operation? A. Union B. Intersection C. Minus D. Aggregation	CO2	BT3
47	Which of the following is not an aggregation operation? A. Max B. Min C. Minus D. Sum	CO2	BT3
48	In E-R diagram generalization is represented by A. Ellipse B. Dashed ellipse C. Rectangle D. Triangle	CO2	BT2
49	In an E-R, Y is the dominant entity and X is a subordinate entity. Then which of the following is incorrect? A. operationally, If Y is deleted, so is X B. X existence is dependent on Y C. operationally, if X is deleted, so is Y D. operationally, if X is deleted, Y remains the same	CO2	BT2

50	---------- denote derived attributes. A. Double ellipse B. Dashed ellipse C. Squared ellipse D. Ellipse with attribute name underlined	CO2	BT3
	PART B (4 Marks)		
1.	What is the difference between a database schema and a database state? The following points explain the main differences between database and schema: ● The fundamental difference between them is that the database is an organized collection of interrelated data or information about the considered object. In contrast, the schema is a logical representation or description of an entire database. ● Once we declare a database schema, we must not change it often as it would disturb the organization of data stored in the database. In contrast, we can update the database regularly. ● The database is a collection of schema, records, and constraints for the tables. On the other hand, a schema contains the structure of tables, attributes, their types, constraints, and how they relate to other tables. ● The DDL statement is used to generate and modify the schema. On the other hand, DML statements are used to create and modify the data inside the database. ● Each database uses the memory to store the data, whereas the schema can use a logical structure to store data.	CO2	BT1

Comparison Basis	Database	Schema
Definition	The database is an application that stores the organized collection of interrelated data.	The schema is a logical representation of a database.
Statement	A DML is used to generate and modify the records in the database.	A DDL statement defined the schema for a database.
Modification	A database is updating the data regularly so that it can change frequently.	We should not change a schema often once it is declared.
Include	A database is a collection of schema, records, and constraints for the tables.	A schema always included the name of the tables, columns name, their types, and constraints.
Memory	It uses memory to store data.	It does not use memory to store data.

2	What is an entity type? What is an entity set? Explain the differences among an entity, an entity type, and an entity set. The entity type refers to the collection of entity that share a common definition. Entity set is the set of entities of the same type that share the same attributes. E.g. Set of all people who are customer at a particular bank can be defined as the entity customer, while, Entity set of entities of the same entity type. **Entity:** It is something which has real existence. **Entity Type:** It is collection of entity having common attribute. Also each entity type in a database is described by a name and a list of attribute. So we may say a table is an entity type **Entity SET:** It is a set of entities of same entity type. So a set of one or more entities of an Entity type is an Entity Set.	CO2	BT1

3	When is the concept of a weak entity used in data modeling? Define the terms owner entity type, weak entity type, identifying relationship type, and partial key. Concept of weak entity types is used in data modeling when we want to specify a new entity type similar to the one we already have, but we want this new entity type to have specific attributes and to be able to participate in specific relationships. If the newly made entity type doesn't have key attributes, it is called weak entity type and it needs to be related to a strong entity type (directly or indirectly) that has: key attributes of its own. Owner (or identifying) entity type is a title for entity type that identifies weak entity types related to it. Weak entity types include one of their attributes when combining with owner entity type. Weak entity type is an entity type that does not have key attributes of its own. Identifying relationship type is a title for relationship type that relates one weaker entity type to one owner entity type. In this relationship type, weak entity has a total participation constraint, meaning it cannot exist without its owner entity type that identifies it. Partial key (or discriminator) is an attribute or set of attributes of a weak entity type that distinguishes weak entities related to the same owner entity type.	CO2	BT1
4	Can an identifying relationship of a weak entity type be of a degree greater than two? Give examples to illustrate your answer. An identifying relationship of a weak entity type can be of a degree greater than two. An example of this would be the ternary relationship of Supply. Supply is a weak entity type that has three identifying relationships.	CO2	BT2
5	Draw an ER schema diagram for the COMPANY database. 	CO2	BT1

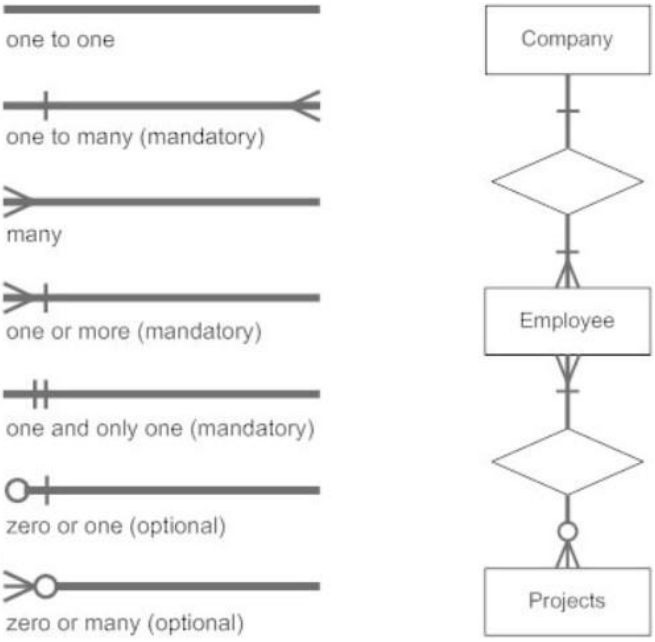
6	Describe the two alternatives for specifying structural constraints on relationship types. What are the advantages and disadvantages of each? The **two alternatives** for specifying structural **constraints** on relationship types are : ● Cardinality ratio and ● Participation constraint **Cardinality ratio** **Cardinality ratio** is a simple way of specifying designs, it is specifies the maximum number of relationship a body/entity can be engaged in. <u>Advantage of Cardinality ratio</u> It is used to simply **complex designs** <u>Disadvantage of cardinality ratio</u> No specific number can be said to be **maximum** **Participation constraint** **Participation constrain**t specifies the dependency of an entity on another entity based on the relationships existing between the entities <u>Advantage of participation constraint</u> It specifies the **minimum** number of relationship an entity can engage It shows the dependency of an entity on another <u>Disadvantage</u> It is a more **expensive** alternative Hence we can conclude that The **two alternatives** for specifying structural **constraints** on relationship types are : Cardinality ratio and and Participation constraint	CO2	BT2

7	Discuss the two main types of constraints on specializations and generalizations. Specialization: constraints are generally used to provide limitations on data which can be used in table for database. Not null, unique are two constraints used in specialization. Generalization: it is a bottom up approach and in this constraints are used to create limitations in data. Check and default are two constraints used to limit data in generalization.	CO2	BT2
8	What is the difference between specialization and generalization? Why do we not display this difference in schema diagrams? Generalization is process of extracting common characteristics from two or more classes and combining them into a generalized superclass. A Specialization is the reverse process of Generalization means creating new sub classes from an existing class.	CO2	BT1
9	Design a database to keep track of information for an art museum. Assume that the following requirements were collected: ■ The museum has a collection of ART_OBJECTS. Each ART_OBJECT has a unique Id no, an Artist (if known), a Year (when it was created, if known), a Title, and a Description. The art objects are categorized in several ways, as discussed below. ■ ART_OBJECTS are categorized based on their type. There are three main types: PAINTING, SCULPTURE, and STATUE, plus another type called OTHER to accommodate objects that do not fall into one of the three main types.	CO2	BT1

10	Discuss about Entity Types, Entity Sets, Keys, and Value Sets with examples. The entity type is a collection of the entity having similar attributes. In the above Student table example, we have each row as an entity and they are having common attributes i.e. each row has its own value for attributes Roll no, Age, Student name and Mobile no. So, we can define the above STUDENT table as an entity type because it is a collection of entities having the same attributes. So, an entity type in an ER diagram is defined by a name (here, STUDENT) and a set of attributes (here, roll no, Student name, Age, Mobile no). Types of Entity type ● Strong Entity Type ● Weak Entity Type **Strong Entity Type:** Strong entity are those entity types which has a key attribute. The primary key helps in identifying each entity uniquely. It is represented by a rectangle. **Weak Entity Type**: Weak entity type doesn't have a key attribute. Weak entity type can't be identified on its own. It depends upon some other strong entity for its distinct identity. Entity Set is a collection of entities of the same entity type. In the above example of STUDENT entity type, a collection of entities from the Student entity type would form an entity set. We can say that entity type is a superset of the entity set as all the entities are included in the entity type. A key could either be a combination of more than one attribute (or columns) or just a single attribute. The main motive of this is to give each record a unique identity. There are broadly seven types of keys in DBMS: 1. Primary Key 2. Candidate Key 3. Super Key 4. Foreign Key 5. Composite Key 6. Alternate Key 7. Unique Key	CO2	BT2

11	What are the Constraints on Binary Relationship Types? The participation constraint specifies whether the existence of an entity depends on its being related to another entity via the relationship type. This constraint specifies the minimum number of relationship instances that each entity can participate in, and is sometimes called the minimum cardinality constraint. There are two types of participation constraints—total and partial—that we illustrate by example. If a company policy states that every employee must work for a department, then an employee entity can exist only if it participates in at least one WORKS_FOR relationship instance. Thus, the participation of EMPLOYEE in WORKS_FOR is called total participation, meaning that every entity in the total set of employee entities must be related to a department entity via WORKS_FOR. Total participation is also called existence dependency. We do not expect every employee to manage a department, so the participation of EMPLOYEE in the MANAGES relationship type is partial, meaning that some or part of the set of employee entities are related to some department entity via MANAGES, but not necessarily all.	CO2	BT2

12	Define Weak entity and its types. ● A weak entity is an entity set that does not have sufficient attributes for Unique Identification of its records. **Example 1 –** A loan entity cannot be created for a customer if the customer doesn't exist **Example 2 –** A dependents list entity cannot be created if the employee doesn't exist ● Simply a weak entity is nothing but an entity that does not have a primary key attribute ● It **contains** a partial key called a **discriminator which helps in identifying a group of entities from the entity set** ● **A discriminator** is represented by underlining with a **dashed line** <u>Representation</u> ● o A **double rectangle** is used for representing a **weak entity set** o The **double diamond** symbol is used for representing the **relationship between a strong entity and a weak entity** which is known as identifying relationship	CO2	BT2

13	Give a Summary of the notation for ER diagrams with neat diagram representation  p types ıip ıtionship	CO2	BT2

14	Explain about the Constraints on Ternary (or Higher-Degree) Relationships. There are two notations for specifying structural constraints on n-ary relationships, and they specify different constraints. They should thus both be used if it is important to fully specify the structural constraints on a ternary or higher-degree relationship. The first notation is based on the cardinality ratio notation of binary relationships. The second notation is based on the (min, max) notation. A (min, max) on a participation here specifies that each entity is related to at least min and at most max relationship instances in the relation-ship set. These constraints have no bearing on determining the key of an n-ary relationship, where n > 2, but specify a different type of constraint that places restrictions on how many relationship instances each entity can participate in.	CO2	BT2
15	Explain the difference between an attribute and a value set. The difference between an attribute and a value set is: An attribute holds values, while a value set are those things which are contained in a class. An attribute is the name that is given to the property of a class. On the other hand, a value set are those things that are used to represent an object in a given class. For example, an attribute can have the name "Apples" and can hold the value of "abc" while the value set are those things that can be attributed to a class. An attribute is a characteristic. For example, Attributes in the invoice can be price, number, date etc. A value set specifies the set of values that may be assigned to that attribute for each individual entry.	CO2	BT2
	PART C (12 Marks)		
1	Discuss the role of a high-level data model in the database design process.	CO2	BT2
2	Define the following terms: entity, attribute, attribute value, relationship instance, composite attribute, multivalued attribute, derived attribute, complex attribute, key attribute, and value set (domain).	CO2	BT2

3	When is the concept of a weak entity used in data modeling? Define the terms owner entity type, weak entity type, identifying relationship type, and partial key.	CO2	BT2
4	A database is being constructed to keep track of the teams and games of a sports league. A team has a number of players, not all of whom participate in each game. It is desired to keep track of the players participating in each game for each team, the positions they played in that game, and the result of the game. Design an ER schema diagram for this application, stating any assumptions you make. Choose your favorite sport (e.g., soccer, baseball, football).	CO2	BT2
5	Discuss the main categories of data models. What are the basic differences between the relational model, the object model, and the XML model?	CO2	BT2
6	Discuss the naming conventions used for ER schema diagrams.	CO2	BT2
7	Explain in detail about the Conversion of ER to Relational Table with relevant examples.	CO2	BT2
8	Discuss in detail about Key Constraints and Constraints on NULL Values with examples.	CO2	BT2