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MOAAZ SIDDIQ

CS403- Database Management Systems

Solved MCQS

From Midterm Papers

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Virtual University

CS403- Database Management Systems

MIDTERM EXAMINATION

Question No: 1 (Marks: 1) - Please choose one

Which of the following is NOT a feature of Context DFD?

- ▶ one process (which represents the entire system)
- ▶ all sources/sinks (external entities)
- ▶ data flows linking the process to the sources and sinks (external entities)
- ▶ **sub-processes (which explain and decomposed the major process into small processes) (Page 62)**

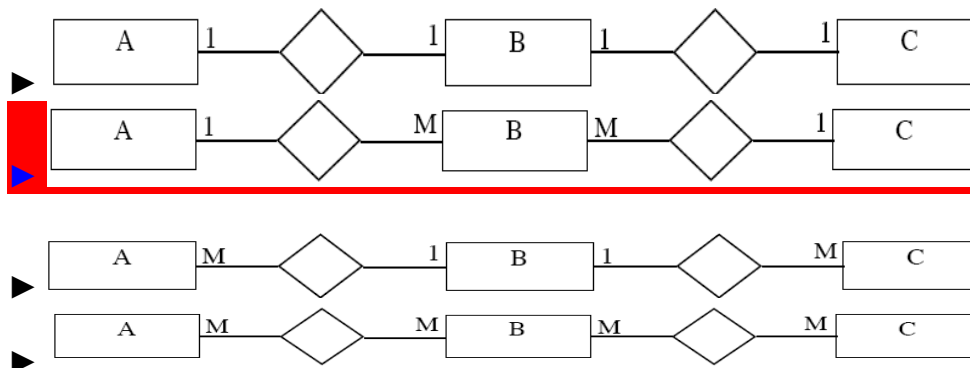
Question No: 2 (Marks: 1) - Please choose one

Which of the following is true for the relational model?

- ▶ Degree of a relation is the number of rows in a relation.
- ▶ Null value is a blank or zero value given to an attribute value when its value is inapplicable or its value is unknown.
- ▶ Complex key is a key consisting of more than one attribute.
- ▶ **Constraint is a rule that restricts the values in a database. (Page 18)**

Question No: 3 (Marks: 1) - Please choose one

Which one of the following four E-R diagrams is the typical result you obtain when you initially start with an E-R diagram containing just two entities, A and C, in a Many-to-Many relationship, and then introduce an associative entity (B).



[Click here for Detail](#)

Question No: 4 (Marks: 1) - Please choose one

Which of the following most certainly implies the need for an entire table to implement?

- ▶ A binary relationship
- ▶ **A ternary relationship** [Click here for Detail](#)
- ▶ A recursive relationship
- ▶ An identifying relationship

Question No: 5 (Marks: 1) - Please choose one

Which of the following constraints enforces entity integrity?

- ▶ PRIMARY KEY
- ▶ FOREIGN KEY
- ▶ CHECK
- ▶ **NOT NULL (Page 134)**

Question No: 6 (Marks: 1) - Please choose one

Which of the following is not true about relational tables?

- ▶ Column values are of the same kind.
- ▶ Each row is unique.
- ▶ Each column must have a unique name.
- ▶ **The sequence of rows is significant.** [Click here for Detail](#)

Question No: 7 (Marks: 1) - Please choose one

In a conceptual model for a university, what type of relationship exists between Grade and Student entities?

- ▶ 1:1
- ▶ **1:M** [Click here for Detail](#)
- ▶ M:M
- ▶ Ternary

Question No: 8 (Marks: 1) - Please choose one

Controlling redundancy in a database management system DOES NOT help to

- ▶ avoid duplication (Page 16)
- ▶ avoid unnecessary wastage of storage space
- ▶ **avoid unauthorised access to data** [Click here for detail](#)
- ▶ avoid inconsistency among data

Question No: 9 (Marks: 1) - Please choose one

Which of the following is INCORRECT with respect to file systems?

- ▶ At the physical level, pointer or hashed address scheme may be employed to provide a certain degree of data independence at the user level.
- ▶ **A logical record is concerned with efficient storage of information in the secondary storage devices.**
- ▶ Some physical organisations use pointers to record blocks to locate records on disk.
- ▶ The efficiency of a file system depends on how efficiently operations such as retrieve, insert, update, delete may be performed on the information stored in the file.

Question No: 10 (Marks: 1) - Please choose one

Which of the following functions are NOT performed by a database administrator?

- ▶ Planning, designing and implementing database systems
- ▶ Establishing standards and procedures for database systems
- ▶ **Communicating with database users (Page 26)**
- ▶ Allocation of storage locations and data structures

Question No: 11 (Marks: 1) - Please choose one

Select the correct statement about the ANSI/SPARC architecture.

- ▶ **The conceptual level is a level of indication between the internal level and the external level. (Page 33)**
- ▶ The internal level in a database system will definitely be relational.
- ▶ Any given database has many conceptual schemas and one physical schema, but it has only one external schemas.
- ▶ The external level is not concerned with individual user perceptions, while the conceptual level is concerned with a community user perception.

Question No: 12 (Marks: 1) - Please choose one

Which of the following is a correct way to implement one-to-many relationship while designing tables?

- ▶ **by splitting the data into two tables with primary key and foreign key relationships.**
[Click here for Detail](#)
- ▶ using a junction table with the keys from both the tables forming the composite primary key of the junction table.
- ▶ by splitting each table into three
- ▶ as a single table and rarely as two tables with primary and foreign key relationships.

Question No: 13 (Marks: 1) - Please choose one

Which of the following is not a benefit of normalization?

- ▶ Minimize insertion anomalies
- ▶ Minimize deletion anomalies
- ▶ Minimize updation anomalies
- ▶ **Maximize redundancy (Page 162)**

Question No: 14 (Marks: 1) - Please choose one

Consider the following relation R and its sample data. (Consider that these are the only tuples for the given relation)

EmpNo	DeptNo	ProjNo
1001	01	12
1001	01	13
1002	01	12
1003	01	14

Which of the following statements is NOT correct?

- ▶ The functional dependency (EmpNo, DeptNo) \rightarrow ProjNo holds over R.
- ▶ The functional dependency EmpNo \rightarrow DeptNo holds over R.
- ▶ The functional dependency ProjNo \rightarrow DeptNo holds over R.
- ▶ **The functional dependency (EmpNo, ProjNo) \rightarrow DeptNo holds over R.**

Question No: 15 (Marks: 1) - Please choose one

The Entity Relation Model models

- ▶ Entities, Relationships and Processes
- ▶ **Entities and Relationships (Page 71)**
- ▶ Relationships
- ▶ Entities

Question No: 16 (Marks: 1) - Please choose one

As part of database naming conventions, attribute names should use suffixes such as ID, NUMBER or CODE for the _____.

- ▶ **primary key**
- ▶ foreign key
- ▶ index
- ▶ determinant

MIDTERM EXAMINATION
CS403- Database Management Systems

Question No: 1 (Marks: 1) - Please choose one

User rights information is stored in

- ▶ Physical database
- ▶ **Catalog (Page 46)**
- ▶ Logical database
- ▶ Buffer

Question No: 2 (Marks: 1) - Please choose one

Making a change to the conceptual schema of a database but not affecting the existing external schemas is an example of

- ▶ Physical data independence.
- ▶ Concurrency control.
- ▶ **Logical data independence.** [Click here for detail](#)
- ▶ Functional dependency

Question No: 3 (Marks: 1) - Please choose one

Which of the following is NOT a feature of Context DFD?

- ▶ one process (which represents the entire system)
- ▶ all sources/sinks (external entities)
- ▶ data flows linking the process to the sources and sinks (external entities)
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rep

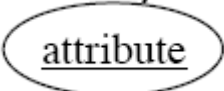
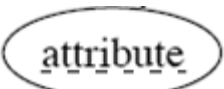
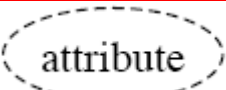

Question No: 4 (Marks: 1) - Please choose one

A relation (from the relational database model) consists of a set of tuples, which implies that

- ▶ **all tuples in a relation must be distinct. (Page 129)**
- ▶ relational model supports multi-valued attributes whose values can be represented in sets.
- ▶ for any two tuples, the values associated with all of their attributes may be the same.
- ▶ all tuples in a particular relation may have different attributes.

Question No: 5 (Marks: 1) - Please choose one

Choose the symbol that corresponds to a discriminator attributes.

- ▶ 
- ▶  [Click here for detail](#)
- ▶ 
- ▶ 

Question No: 6 (Marks: 1) - Please choose one

Identify the constraint that limits the values that can be placed in a column.

- ▶ NOT NULL
- ▶ **CHECK** [Click here for Detail](#)
- ▶ FOREIGN KEY
- ▶ UNIQUE

Question No: 7 (Marks: 1) - Please choose one

Given are the relations of student and Instructor

<i>Student</i>		<i>Instructor</i>	
First Name	Last Name	Fname	Lname
Saman	Perera	Ajith	Gamage
Romesh	Dias	Sujith	Hewage
Jeeva	Silva	Saman	Perera
Nadee	Alwis	Kasun	Peiris
Kumari	Costa	Romesh	Dias
Geetha	Zoysa		
Prasad	Fernando		

Consider the following table obtained using Student and Instructor relations.

Fname	Lname
Ajith	Gamage
Sujith	Hewage
Kasun	Peiris

Which relational algebra operation could have been applied on the pair of relations Student and Instructor to obtain the above data?

- ▶ **Instructor – Student**
- ▶ $\text{Student} \cap \text{Instructor}$
- ▶ $\text{Instructor} \div \text{Student}$
- ▶ $\text{Student} - \text{Instructor}$

Question No: 8 (Marks: 1) - Please choose one

Identify the correct statement with respect to normalization.

- ▶ Normalization is a formal technique that can be used only at the starting phase of the database design.
- ▶ **Normalization can be used as a top-down standalone database design technique.**

[Click here for detail](#)

- ▶ The process of normalization through decomposition must achieve the lossless join property at any cost whereas the dependency reservation property is sometimes sacrificed.
- ▶ The process of normalization through decomposition must achieve the dependency reservation property at any cost whereas the lossless join property is sometimes sacrificed.

Question No: 9 (Marks: 1) - Please choose one

Consider the relation Interview(CandidateNo, InterviewDate, InterviewTime, StaffNo, RoomNo) and the following functional dependencies.

FD1 : CandidateNo, InterviewDate -> InterviewTime, StaffNo, RoomNo

FD2 : RoomNo, InterviewDate, InterviewTime -> StaffNo, CandidateNo

FD3 : StaffNo, InterviewDate -> RoomNo

Which of the following is correct?

- ▶ **The relation Interview is in 3NF** [Click here for detail](#)
- ▶ The relation Interview is in BCNF.
- ▶ The FD3 violates 3NF.
- ▶ The FD2 violates 2NF.

Question No: 10 (Marks: 1) - Please choose one

Identify the INCORRECT statement among the given.

- ▶ An entity may be an object with a physical existence like a car, a house or an Employee.
- ▶ **One cannot consider something which has conceptual existence like a course in a degree program as an entity.** (Page 71)
- ▶ Age can be considered as a single value attribute of a person.
- ▶ An entity type describes the schema or intension for a set of entities which share the same structure.

Question No: 11 (Marks: 1) - Please choose one

Structural constraints of a relationship type refer to

- ▶ identifying the owner entity type relevant to a given entity type
- ▶ **whether the existence of an entity depends on it being related to another entity via the relationship type.** [Click here for detail](#)
- ▶ the role that a participating entity from the entity type plays in each relationship instance.
- ▶ the constraints applicable in granting access to tables, columns and views in a database schema.

Question No: 12 (Marks: 1) - Please choose one

A collection of concepts that can be used to describe the structure of a database

- ▶ Database
- ▶ DBMS
- ▶ **Data model** [Click here for Detail](#) (Page 68)
- ▶ Data

Question No: 13 (Marks: 1) - Please choose one

An entity can be logically connected to another by defining a ____.

- ▶ hyperlink
- ▶ **common attribute** [Click here for detail](#)
- ▶ primary key
- ▶ superkey

Question No: 14 (Marks: 1) - Please choose one

The ____ constraint specifies whether each entity supertype occurrence must also be a member of at least one subtype.

- ▶ specialization
- ▶ uniqueness
- ▶ inheritance
- ▶ **completeness** [Click here for Detail](#)

Question No: 15 (Marks: 1) - Please choose one

Database management systems, operating systems, applications and utilities are all examples of ____.

- ▶ hardware
- ▶ **software** [Click here for detail](#)
- ▶ computer infrastructure
- ▶ input and output

Question No: 16 (Marks: 1) - Please choose one

Which of the following concepts is applicable with respect to 2NF?

- ▶ **Full functional dependency** [Click here for detail](#)
- ▶ Any kind of dependency
- ▶ Transitive dependency
- ▶ Non-transitive dependency

MIDTERM EXAMINATION
CS403- Database Management Systems

Question No: 1 (Marks: 1) - Please choose one

A database system allows the following EXCEPT

- ▶ management and control of data towards an efficient working of an organisation.
- ▶ more critical functions in organisations to be computerised and the need to keep a large volume of data available in an up to the minute current state increased.
- ▶ **any user to access all its data.**
- ▶ integration of data across multiple applications into a single application.

Question No: 2 (Marks: 1) - Please choose one

User rights information is stored in

- ▶ Physical database
- ▶ **Catalog (Page 46) rep**
- ▶ Logical database
- ▶ Buffer

Question No: 3 (Marks: 1) - Please choose one

The ER- data model is an example of:

- ▶ Physical database
- ▶ Logical database
- ▶ Relational database
- ▶ **Conceptual database** [Click here for Detail](#)

Question No: 4 (Marks: 1) - Please choose one

Which of the following is true about NOT NULL constraint?

- ▶ enforce domain integrity
- ▶ limit the values that can be placed in a column.
- ▶ **prevents any actions that would destroy links between tables with the corresponding data values** [Click here for detail](#)
- ▶ enforces the uniqueness of the values in a set of columns

Question No: 5 (Marks: 1) - Please choose one

Consider the relation Interview(CandidateNo, InterviewDate, InterviewTime, StaffNo, RoomNo) and the following functional dependencies.

FD1 : CandidateNo, InterviewDate -> InterviewTime, StaffNo, RoomNo

FD2 : RoomNo, InterviewDate, InterviewTime -> StaffNo, CandidateNo

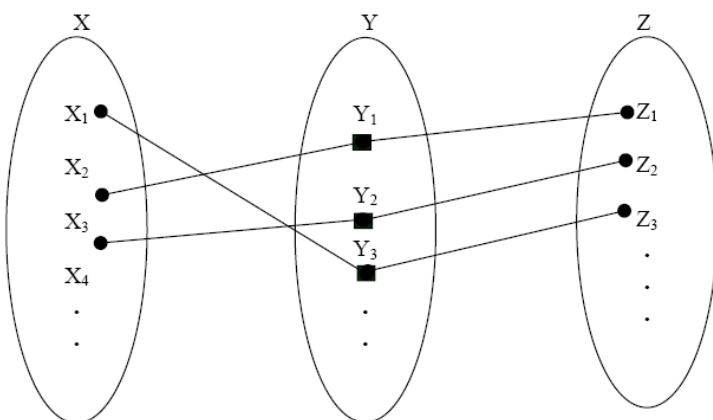
FD3 : StaffNo, InterviewDate -> RoomNo

Which of the following is correct?

- ▶ The relation Interview is in BCNF.
- ▶ The FD3 violates 3NF.
- ▶ The FD3 violates BCNF.
- ▶ The FD2 violates 2NF.

Question No: 6 (Marks: 1) - Please choose one

Consider the following diagram depicting a kind of a relationship type where X and Z are entities and Y is a relationship type:



Select the correct statement among the following on the above diagram.

► **The relationship type Y is of cardinality ratio 1 : N.** [Click here for Detail](#)

- The diagram depicts existence dependencies.
- The participation of X in the Y relationship type is total.
- The participation of Z in the Y relationship type is partial.

Question No: 7 (Marks: 1) - Please choose one

Select the correct statement among the following.

- Role names are not technically necessary in relationship types when all the participating entity types are distinct.
- **When different entity types participate only once in a single relationship type it is called a recursive relationship. (Page 87)**
- Cardinality ratios for binary relationship are displayed on Entity Relationship Diagrams by using a diamond shape notation.
- Partial participation which is also called existence dependency is displayed as a double line connecting the participating entity type to the relationship.

Question No: 8 (Marks: 1) - Please choose one

Which of the following is true about relational schema?

- The sequence of columns is significant
- The sequence of rows is significant.
- Contains only derived attributes.
- **Values are atomic. (Page 127)**

Question No: 9 (Marks: 1) - Please choose one

Consider the given relations Student and Instructor as given below. Please note that Fname and Lname also denote the First Name and Last Name respectively.

<i>Student</i>	
First Name	Last Name
Saman	Perera
Romesh	Dias
Jeeva	Silva
Nadee	Alwis
Kumari	Costa
Geetha	Zoysa
Prasad	Fernando

<i>Instructor</i>	
Fname	Lname
Ajith	Gamage
Sujith	Hewage
Saman	Perera
Kasun	Peiris
Romesh	Dias

Which of the following statements is correct with respect to the two relations given above?

- The two relations are not union-compatible since their attribute names differ.
- **The set operations such as CARTESIAN PRODUCT and DIVISION can be applied on these two relations.**
- To find out those students who work as instructors, it is necessary to perform the operation $\text{Student} \cap \text{Instructor}$.
- To find out the students who are not instructors, it is necessary to perform the operation $\text{Student} \div \text{Instructor}$.

Question No: 11 (Marks: 1) - Please choose one Consider the following relation R and its sample data. (Consider that these are the only tuples for the given relation)

EmpNo	DeptNo	ProjNo
1001	01	12
1001	01	13
1002	01	12
1003	01	14

Which of the following statements is NOT correct?

- ▶ The functional dependency ProjNo \rightarrow DeptNo holds over R.
- ▶ **The functional dependency (EmpNo, ProjNo) \rightarrow DeptNo holds over R.**
- ▶ The functional dependency DeptNo \rightarrow ProjNo holds over R.
- ▶ The functional dependency EmpNo \rightarrow DeptNo holds over R.

Question No: 12 (Marks: 1) - Please choose one

A collection of related data is

- ▶ Logical model
- ▶ **Database (Page 10)**
- ▶ Data
- ▶ Relational model

Question No: 13 (Marks: 1) - Please choose one

A weak entity type

- ▶ must have total participation in an identifying relationship
- ▶ does not have a key attribute(s)
- ▶ **both (a) and (b) [Click here for detail](#)**
- ▶ none of the above

Question No: 14 (Marks: 1) - Please choose one

A description on a particular collection of data using the given data model

- ▶ Database
- ▶ **Schema (Page 18)**
- ▶ None of the above.
- ▶ Relation

Question No: 15 (Marks: 1) - Please choose one

If K is a foreign key in relation R1, then

- ▶ every tuple of R1 has a distinct value for K.
- ▶ K cannot have a null value for tuples in R1.
- ▶ **K is a key for some other relation. [Click here for detail](#)**
- ▶ K is a primary key for R1.

Question No: 16 (Marks: 1) - Please choose one

Consider the following statements.

- A. An entity integrity constraint states that no primary key value can be null.
- B. A referential integrity constraint is specified between two relations.
- C. A foreign key cannot be used to refer to its own relation.

Identify which of the above statements is/are correct.

► **Only A (Page 134)**

- Only B
- B and C
- A and B

MIDTERM EXAMINATION
CS403- Database Management Systems

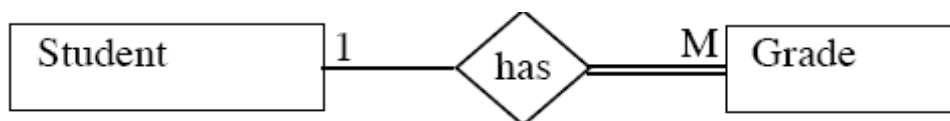
Question No: 1 (Marks: 1) - Please choose one

Which of the following constraints enforces entity integrity?

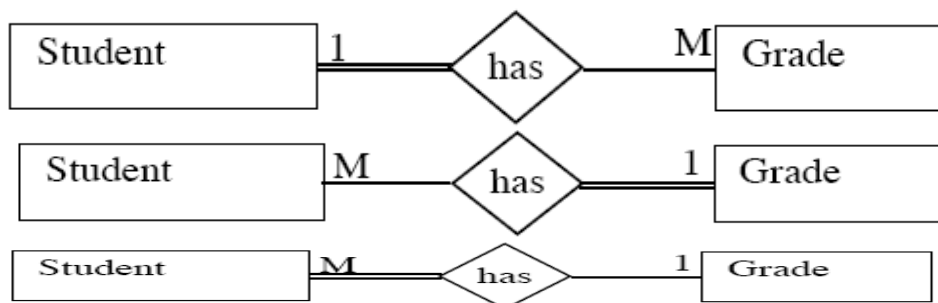
- PRIMARY KEY
- FOREIGN KEY
- CHECK
- **NOT NULL (Page 134) rep**

Question No: 2 (Marks: 1) - Please choose one

Which one of the following E-R diagrams most correctly represents the relationship between Student and Grade entities?



[Click here for detail](#)



Question No: 3 (Marks: 1) - Please choose one

Which of the following constraints enforces entity integrity?

- ▶ PRIMARY KEY
- ▶ FOREIGN KEY
- ▶ CHECK
- ▶ NOT NULL (Page 134) rep

Question No: 4 (Marks: 1) - Please choose one

Which of the following enforces a relation into 1st normal form?

- ▶ The domain of attribute must include only atomic values. (Page 167)
- ▶ Every non-key attribute is fully functionally dependent on primary key
- ▶ non-key attribute is non-transitively dependent on primary key.
- ▶ Every non-key attribute is partially dependent on super key

Question No:5 (Marks: 1) - Please choose one

Consider the following set of functional dependencies (FDs) on the following relational schema.

Emp_No -> {Ename, Bdate, Address, Dept_No}

Dept_No -> {Dname, Mgr_No}

The additional FD which can be inferred from the above set of FDs is

- ▶ Emp_No -> {Dname, Mgr_No}
- ▶ Emp_Name -> Dept_No .
- ▶ Emp_Name -> Dept_Name .
- ▶ Emp_Name, Dept_No -> Mgr_No .

Question No: 6 (Marks: 1) - Please choose one

Which of the following is a feature of PRIMARY KEY constraint?

- ▶ unique identifier for a row within a database table. [Click here for Detail](#)
- ▶ allow any actions that would destroy links between tables
- ▶ limit the values that can be placed in a column.
- ▶ enforces that the column will only accept null values.

Question No: 7 (Marks: 1) - Please choose one

Structural constraints of a relationship type refer to

- ▶ identifying the owner entity type relevant to a given entity type
- ▶ whether the existence of an entity depends on it being related to another entity via the relationship type. [Click here for detail](#)
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- ▶ the constraints applicable in granting access to tables, columns and views in a database schema.

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Which of the following is true about relational schema?

- ▶ The sequence of columns is significant
- ▶ The sequence of rows is significant.
- ▶ Contains only derived attributes.
- ▶ **Values are atomic. (Page 127) rep**

Question No: 9 (Marks: 1) - Please choose one

A ____ relationship exists when an association is maintained within a single entity.

- ▶ **unary (Page 144)**
- ▶ ternary
- ▶ binary
- ▶ weak

Question No: 10 (Marks: 1) - Please choose one

Which of the following is a correct way to implement one-to-many relationship while designing tables?

- ▶ **by splitting the data into two tables with primary key and foreign key relationships.**
[Click here for Detail](#)
- ▶ using a junction table with the keys from both the tables forming the composite primary key of the junction table.
- ▶ by splitting each table into three
- ▶ as a single table and rarely as two tables with primary and foreign key relationships.

Question No: 11 (Marks: 1) - Please choose one

Identify the correct statement.

- ▶ Entity integrity constraints specify that primary key values can be composite.
- ▶ **Entity integrity constraints are specified on individual relations. [Click here for detail](#)**
- ▶ Entity integrity constraints are specified between weak entities.
- ▶ When entity integrity rules are enforced, a tuple in one relation that refers to another relation must refer to an existing tuple.

Question No: 12 (Marks: 1) - Please choose one

A software package designed to store and manage databases

- ▶ Database
- ▶ **DBMS (Page 18)**
- ▶ Data model
- ▶ Data

Question No: 13 (Marks: 1) - Please choose one

Who is responsible for authorizing access to the database, for coordinating and monitoring its use?
Select correct option:

- ▶ Database Designer
- ▶ **Database Administrator (Page 26)**
- ▶ End User
- ▶ Application Programmer

Question No: 14 (Marks: 1) - Please choose one

Consider the following relation R and its sample data. (Consider that these are the only tuples for the given relation)

EmpNo	DeptNo	ProjNo
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Which of the following statements is NOT correct?

- ▶ The functional dependency (EmpNo, DeptNo) \rightarrow ProjNo holds over R.
- ▶ The functional dependency EmpNo \rightarrow DeptNo holds over R.
- ▶ The functional dependency ProjNo \rightarrow DeptNo holds over R.
- ▶ **The functional dependency (EmpNo, ProjNo) \rightarrow DeptNo holds over R.**

Question No: 15 (Marks: 1) - Please choose one

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- ▶ The functional dependency EmpNo \rightarrow DeptNo holds over R.
- ▶ The functional dependency ProjNo \rightarrow DeptNo holds over R.
- ▶ **The functional dependency (EmpNo, ProjNo) \rightarrow DeptNo holds over R.**

Question No: 16 (Marks: 1) - Please choose one

Which feature of database provides conversion from inconsistent state of DB to a consistent state ensuring minimum data loss?

Select correct option:

- ▶ User accessible catalog
- ▶ Data processing
- ▶ **Recovery service (Page 47)**
- ▶ Authorization service

MIDTERM EXAMINATION

CS403- Database Management Systems

Question No: 1 (Marks: 1)

Consider the following statements.

- A. Conceptual schema which is the result of conceptual design is a logical description of all data elements and their relationships.
- B. Internal level of the database architecture consists of the physical view of the database.
- C. External level of the database architecture provides the user view of the database.

With respect to the ANSI/SPARC three level database architecture, which of the above is/are correct?

- ▶ Only A.
- ▶ Only C.
- ▶ Only A and B.
- ▶ **Only B and C. (Page 40)**

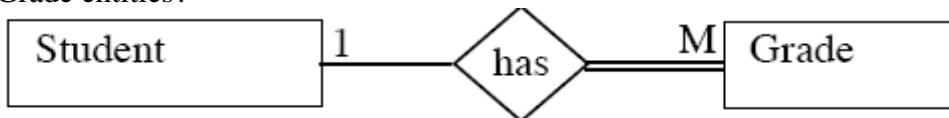
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The ER- data model is an example of:

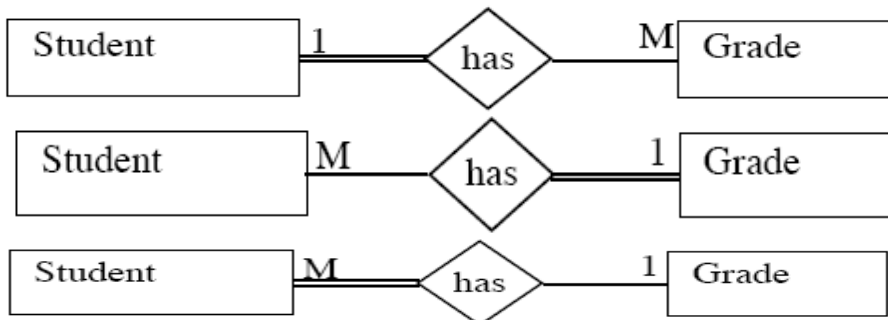
- ▶ Physical database
- ▶ Logical database
- ▶ Relational database
- ▶ **Conceptual database** [Click here for Detail](#) rep

Question No: 3 (Marks: 1)

Which one of the following E-R diagrams most correctly represents the relationship between Student and Grade entities?



[Click here for detail](#) rep



Question No: 4 (Marks: 1)

Which of the following constraints enforces referential integrity?

- ▶ **FOREIGN KEY (Page 134)**
- ▶ CHECK
- ▶ PRIMARY KEY
- ▶ UNIQUE

Question No: 5 (Marks: 1)

Given are the relations of student and Instructor

<i>Student</i>	
First Name	Last Name
Saman	Perera
Romesh	Dias
Jeeva	Silva
Nadee	Alwis
Kumari	Costa
Geetha	Zoysa
Prasad	Fernando

<i>Instructor</i>	
Fname	Lname
Ajith	Gamage
Sujith	Hewage
Saman	Perera
Kasun	Peiris
Romesh	Dias

Consider the following table obtained using Student and Instructor relations.

Fname	Lname
Ajith	Gamage
Sujith	Hewage
Kasun	Peiris

Which relational algebra operation could have been applied on the pair of relations Student and Instructor to obtain the above data?

- ▶ **Instructor – Student**
- ▶ $\text{Student} \cap \text{Instructor}$
- ▶ $\text{Instructor} \div \text{Student}$
- ▶ $\text{Student} - \text{Instructor}$

Question No: 6 (Marks: 1)

Consider the relation Interview (CandidateNo, InterviewDate, InterviewTime, StaffNo, RoomNo) and the following functional dependencies.

FD1 : CandidateNo, InterviewDate \rightarrow InterviewTime, StaffNo, RoomNo

FD2 : RoomNo, InterviewDate, InterviewTime \rightarrow StaffNo, CandidateNo

FD3 : StaffNo, InterviewDate \rightarrow RoomNo

Which of the following is correct?

- ▶ **The relation Interview is in 3NF** [Click here for detail](#)
- ▶ The relation Interview is in BCNF.
- ▶ The FD3 violates 3NF.
- ▶ The FD2 violates 2NF.

Question No: 7 (Marks: 1)

Which of the following is INCORRECT statement concerning the database design process?

- ▶ During requirements collection and analysis phase, one can gather the data requirements of database users.
- ▶ By referring to a high level data model, it is possible to understand the data requirements of the users, entity types, relationships and constraints.
- ▶ Transformation of the high level data model into the implementation data model is called logical design or data model mapping.
- ▶ **During the logical design phase of internal storage structures, access paths and file organization for the database files are specified. (Page 53)**

Question No: 8 (Marks: 1)

Consider the following diagram depicting a kind of a relationship type where X and Z are entities and Y is a relationship type:

Select the correct statement among the following on the above diagram.

- ▶ **The relationship type Y is of cardinality ratio 1 : N. [Click here for Detail](#) rep**
- ▶ The diagram depicts existence dependencies.
- ▶ The participation of X in the Y relationship type is total.
- ▶ The participation of Z in the Y relationship type is partial.

Question No: 9 (Marks: 1)

Identify the correct statement.

- ▶ Entity integrity constraints specify that primary key values can be composite.
- ▶ **Entity integrity constraints are specified on individual relations. [Click here for detail](#) rep**
- ▶ Entity integrity constraints are specified between weak entities.
- ▶ When entity integrity rules are enforced, a tuple in one relation that refers to another relation must refer to an existing tuple.

Question No: 10 (Marks: 1)

Identify the correct statement.

- ▶ Referential integrity constraints check whether the primary key values are unique.
- ▶ Referential integrity constraints check whether an attribute value lies in the given range.
- ▶ Referential integrity constraints are specified between entities having recursive relationships.
- ▶ **When Referential integrity rules are enforced, a tuple in one relation that refers to another relation must refer to an existing tuple. (Page 134)**

Question No: 11 (Marks: 1)

Identify the correct way to implement one-to-one relationship in tables?

- ▶ by splitting the data into two tables with primary key and foreign key relationships.
- ▶ **as a single table and rarely as two tables with primary and foreign key relationships.**

[Click here for Detail](#)

- ▶ using a junction table with the keys from both the tables forming the composite primary key of the junction table.
- ▶ by creating two separate tables

Question No: 12 (Marks: 1)

A collection of related data is

- ▶ Logical model
- ▶ **Database (Page 10) rep**
- ▶ Data
- ▶ Relational model

Question No: 13 (Marks: 1)

A collection of concepts that can be used to describe the structure of a database

- ▶ Database
- ▶ DBMS
- ▶ **Data model** [Click here for Detail](#) (Page 68)
- ▶ Data

Question No: 14 (Marks: 1)

A superkey that does not contain a subset of attributes that is itself a superkey is called a ____.

- ▶ **candidate key (Page 82)**
- ▶ primary key
- ▶ superkey
- ▶ secondary key

Question No: 15 (Marks: 1)

As part of database naming conventions, attribute names should use suffixes such as ID, NUMBER or CODE for the _____.

- ▶ **primary key**
- ▶ foreign key
- ▶ index
- ▶ determinant

Question No: 16 (Marks: 1)

Which of the following concepts is applicable with respect to 2NF?

- ▶ **Full functional dependency** [Click here for detail](#)
- ▶ Any kind of dependency
- ▶ Transitive dependency
- ▶ Non-transitive dependency

MIDTERM EXAMINATION
CS403- Database Management Systems

Question No: 1 (Marks: 1) - Please choose one

Which of the following functions are NOT performed by a database administrator?

- ▶ Planning, designing and implementing database systems
- ▶ Establishing standards and procedures for database systems
- ▶ **Communicating with database users (Page 26) rep**
- ▶ Allocation of storage locations and data structures

Question No: 2 (Marks: 1) - Please choose one

Identify the factor which enforces a relation in 3NF?

- ▶ Every non-key attribute is fully functionally dependent on primary key
- ▶ Every non-key attribute is partially dependent on super key
- ▶ **The domain of attribute must include only atomic values. (Page 167)**
- ▶ Every non-key attribute is non-transitively dependent on primary key.

Question No: 3 (Marks: 1) - Please choose one

Consider two sets A and B. A contains 2 elements and B contains 3. How many elements do their cartesian product contains?

- ▶ **6 (Page 129)**
- ▶ 9
- ▶ 5
- ▶ 4

Question No: 4 (Marks: 1) - Please choose one

Identify the operation which is NOT one of the parts of the five basic set operations in relational algebra?

- ▶ **Join [Click here for Detail](#)**
- ▶ Union
- ▶ Cartesian Product
- ▶ Set Difference

Question No: 5 (Marks: 1) - Please choose one

Consider the following statements.

- A. An entity integrity constraint states that no primary key value can be null.
- B. A referential integrity constraint is specified between two relations.
- C. A foreign key cannot be used to refer to its own relation.

Identify which of the above statements is/are correct.

► Only A (Page 134) rep

► Only B

► Only B and C

► Only A and B

Question No: 6 (Marks: 1) - Please choose one
User rights information is stored in

► Physical database

► **Catalog (Page 46) rep**

► Logical database

► Buffer

Question No: 7 (Marks: 1) - Please choose one
Given are the relations of student and Instructor

Student

First Name	Last Name
Saman	Perera
Romesh	Dias
Jeeva	Silva
Nadee	Alwis
Kumari	Costa
Geetha	Zoysa
Prasad	Fernando

Instructor

Fname	Lname
Ajith	Gamage
Sujith	Hewage
Saman	Perera
Kasun	Peiris
Romesh	Dias

Consider the following table obtained using Student and Instructor relations.

Fname	Lname
Ajith	Gamage
Sujith	Hewage
Kasun	Peiris

Which relational algebra operation could have been applied on the pair of relations Student and Instructor to obtain the above data?

► **Instructor – Student**

► $\text{Student} \cap \text{Instructor}$

► $\text{Instructor} \div \text{Student}$

► $\text{Student} - \text{Instructor}$

Question No: 8 (Marks: 1) - Please choose one

Which one is the corrected way to implement M to M relation which designing data base

- ▶ using junction table with keys
- ▶ By splitting data into tables with PK and FK
- ▶ As a single table rarly as to tables with PK and FK
- ▶ By creating three tables and linking them through PK and FK

Question No: 9 (Marks: 1) - Please choose one

Which enforce the a relation into 2NF User rights information is stored in

- ▶ Physical database
- ▶ **Catalog (Page 46) rep**
- ▶ Logical database
- ▶ Buffer

Question No: 10 (Marks: 1) - Please choose one

Which of the following concepts is applicable with respect to 3NF?

- ▶ Full functional dependency
- ▶ Any kind of dependency
- ▶ **Transitive dependency (Page 172)**
- ▶ Partial functional dependency

Question No: 11 (Marks: 1) - Please choose one

Description on particular collection of data using data model

- ▶ **Schema [Click here for Detail](#) (Page 19)**
- ▶ Relation
- ▶ Data base
- ▶ None of the above

Question No: 12 (Marks: 1) - Please choose one

Which one is true regarding relation?

- ▶ Every attribute value Non atomic
- ▶ Attribute in table may not have unique name
- ▶ table order of the column is relevant
- ▶ **the order of the rows is irrelevant [Click here for detail](#)**

MIDTERM EXAMINATION
CS403- Database Management Systems

Question No: 1 (Marks: 1) - Please choose one
Which of the following is not a benefit of normalization?

- ▶ Minimize insertion anomalies
- ▶ Minimize deletion anomalies
- ▶ Minimize updation anomalies
- ▶ **Maximize redundancy** (Page 162) rep

Question No: 2 (Marks: 1) - Please choose one
Controlling redundancy in a database management system DOES NOT help to

- ▶ **avoid duplication** (Page 16) rep
- ▶ avoid unnecessary wastage of storage space
- ▶ **avoid unauthorized access to data** [Click here for detail](#)
- ▶ avoid inconsistency among data

Question No: 3 (Marks: 1) - Please choose one
In a conceptual database model, which of the following most likely represents a valid identifier for a class grades?

- ▶ StudentID
- ▶ StudentID, CourseID
- ▶ StudentID, CourseID, InstructorID
- ▶ **StudentID, CourseSectionID** [Click here for Detail](#)

Question No: 4 (Marks: 1) - Please choose one
Identify the operation which is NOT one of the parts of the five basic set operations in relational algebra?

- ▶ **Join** [Click here for Detail](#) rep
- ▶ Union
- ▶ Cartesian Product
- ▶ Set Difference

Question No: 5 (Marks: 1) - Please choose one
Making a change to the conceptual schema of a database but not affecting the existing external schemas is an example of

- ▶ Physical data independence.
- ▶ Concurrency control.
- ▶ **Logical data independence.** [Click here for detail](#)
- ▶ Functional dependency

Question No: 6 (Marks: 1) - Please choose one

Select the correct statement among the following on proper naming of schema constructs:

- ▶ Entity type name applies to all the entities belonging to that entity type and therefore a plural name is selected for entity type.
- ▶ **In the narrative description of the database requirements, verbs tend to indicate the names of relationship types.** [Click here for Detail](#)
- ▶ The nouns arising from a database requirement description can be considered as names of attributes.
- ▶ Additional nouns which are appearing in the narrative description of the database requirements represent the weak entity type names.

Question No: 7 (Marks: 1) - Please choose one

Identify the constraint that limits the values that can be placed in a column.

- ▶ Not null
- ▶ **Check** [Click here for Detail](#) **rep**
- ▶ Foreign Key
- ▶ Unique

Question No: 8 (Marks: 1) - Please choose one

Identify the INCORRECT statement among the given.

- ▶ An entity may be an object with a physical existence like a car, a house or an Employee.
- ▶ **One cannot consider something which has conceptual existence like a course in a degree program as an entity.** (Page 71) **rep**
- ▶ Age can be considered as a single value attribute of a person.
- ▶ An entity type describes the schema or intension for a set of entities which share the same structure.

Question No: 9 (Marks: 1) - Please choose one

Select the correct statement among the following.

- ▶ Role names are not technically necessary in relationship types when all the participating entity types are distinct.
- ▶ **When different entity types participate only once in a single relationship type it is called a recursive relationship.** (Page 87) **rep**
- ▶ Cardinality ratios for binary relationship are displayed on Entity Relationship Diagrams by using a diamond shape notation.
- ▶ Partial participation which is also called existence dependency is displayed as a double line connecting the participating entity type to the relationship.

Question No: 10 (Marks: 1) - Please choose one

If W, X, Y and Z are attributes of a relation, which of the following inference rules for functional dependencies is correct?

- ▶ If $(X, Z) \rightarrow Y$ then $X \rightarrow Y$ and $Z \rightarrow Y$.
- ▶ **If $X \rightarrow Y$ and $X \rightarrow Z$ then $X \rightarrow (Y, Z)$.**
- ▶ If XY then $Y \rightarrow X$
- ▶ If $X \rightarrow Y$ then $(X, Z) \rightarrow (Y, W)$.

Question No: 11 (Marks: 1) - Please choose one
Which of the following is not a benefit of normalization?

- ▶ Minimize insertion anomalies
- ▶ Minimize deletion anomalies
- ▶ Minimize updation anomalies
- ▶ **Maximize redundancy** (Page 162) rep

Question No: 12 (Marks: 1) - Please choose one
A candidate key that does not have a null value and is selected to uniquely identify all other attribute values in any given row is called a .

- ▶ superkey
- ▶ candidate key
- ▶ **primary key** [Click here for Detail](#)
- ▶ secondary key

Question No: 13 (Marks: 1) - Please choose one
Incase of Context-level Diagram, the system is represented by
Select correct option:

- ▶ **One process atleast** [Click here for Detail](#)
- ▶ Two processes atleast
- ▶ One process only
- ▶ Any number of processes

Question No: 14 (Marks: 1) - Please choose one
A _____ is used to maintain a connection between the users of the database system.

Select correct option:

- ▶ Mail server
- ▶ **File Server** [Click here for detail](#)
- ▶ Client-server
- ▶ None of the given.

MIDTERM EXAMINATION
CS403- Database Management Systems

Question No: 1 (Marks: 1) - Please choose one

Which of the following is not a benefit of normalization?

- ▶ Minimize insertion anomalies
- ▶ Minimize deletion anomalies
- ▶ Minimize updation anomalies
- ▶ **Maximize redundancy** (Page 162) rep

Question No: 2 (Marks: 1) - Please choose one

Which of the following is NOT a component of a DFD?

- ▶ Dataflow
- ▶ Datastore
- ▶ External entities
- ▶ **Relationship between external entities** (Page 57)

Question No: 3 (Marks: 1) - Please choose one

Which of the following is correct regarding Dataflow diagram?

- ▶ Single DFD is required to represent a system
- ▶ The dataflow must be bidirectional
- ▶ **Created at increasing levels of detail** [Click here for Detail](#)
- ▶ Used to represent the relationships among the external entities

Question No: 4 (Marks: 1) - Please choose one

Which of the following is CORRECT about database management system's languages?

- ▶ Data definition languages are used to specify the conceptual schema only.
- ▶ Data manipulation languages are used to create the databases.
- ▶ **Data manipulation languages are used for retrieval, insertion, deletion and modification of data.**

[Click here for Detail](#)

- ▶ Data definition languages are only used to update data in the DBMS.

Question No: 5 (Marks: 1) - Please choose one

Controlling redundancy in a database management system DOES NOT help to

- ▶ avoid duplication
- ▶ **avoid unnecessary wastage of storage space** [Click here for detail](#)
- ▶ avoid unauthorised access to data
- ▶ avoid inconsistency among data

Question No: 6 (Marks: 1) - Please choose one

Which of the following concepts is applicable with respect to 3NF?

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- ▶ Any kind of dependency
- ▶ **Transitive dependency (Page 172)**
- ▶ Partial functional dependency

Question No: 7 (Marks: 1) - Please choose one

Consider two sets A and B. A contains 3 elements and B contains 4. How many elements do their Cartesian product contains?

- ▶ **12 (Page 129)**
- ▶ 9
- ▶ 16
- ▶ 7

Question No: 8 (Marks: 1) - Please choose one

Consider two sets A and B. A contains 2 elements and B contains 3. How many elements do their cartesian product contains?

- ▶ **6 (Page 129)**
- ▶ 9
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- ▶ StudentID
- ▶ StudentID, CourseID
- ▶ StudentID, CourseID, InstructorID
- ▶ **StudentID, CourseSectionID** [Click here for Detail](#) rep

Question No: 10 (Marks: 1) - Please choose one

Identify the correct statement with respect to normalization.

- ▶ Normalization is a formal technique that can be used only at the starting phase of the database design.
- ▶ **Normalization can be used as a top-down standalone database design technique.** [Click here for detail](#) rep
- ▶ The process of normalization through decomposition must achieve the lossless join property at any cost whereas the dependency reservation property is sometimes sacrificed.
- ▶ The process of normalization through decomposition must achieve the dependency reservation property at any cost whereas the lossless join property is sometimes sacrificed.

Question No: 11 (Marks: 1) - Please choose one

Consider the following relation and its sample data. (Consider that these are the only tuples for the given relation)

EmpNo	DeptNo	ProjNo
1001	01	12
1001	01	13
1002	01	12
1003	01	14

Which of the following statements is NOT correct?

- ▶ The functional dependency DeptNo \rightarrow ProjNo holds over R.
- ▶ The functional dependency EmpNo \rightarrow DeptNo holds over R.
- ▶ The functional dependency ProjNo \rightarrow DeptNo holds over R.
- ▶ **The functional dependency (EmpNo, ProjNo) \rightarrow DeptNo holds over R.**

Question No: 12 (Marks: 1) - Please choose one

Which of the following is not true about relational tables?

- ▶ Column values are of the same kind.
- ▶ Each row is unique.
- ▶ Each column must have a unique name.
- ▶ **The sequence of rows is significant.** [Click here for Detail](#) **rep**

Question No: 13 (Marks: 1) - Please choose one

Identify the operation which is NOT one of the parts of the five basic set operations in relational algebra?

- ▶ **Join** [Click here for Detail](#) **rep**
- ▶ Union
- ▶ Cartesian Product
- ▶ Set Difference

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- A. An entity integrity constraint states that no primary key value can be null.
- B. A referential integrity constraint is specified between two relations.
- C. A foreign key cannot be used to refer to its own relation.

Identify which of the above statements is/are correct.

- ▶ **Only A (Page 134)** **rep**
- ▶ Only B
- ▶ Only B and C
- ▶ Only A and B

Question No: 15 (Marks: 1) - Please choose one

If K is a foreign key in relation R1, then

- ▶ every tuple of R1 has a distinct value for K.
- ▶ K cannot have a null value for tuples in R1.
- ▶ **K is a key for some other relation.** [Click here for detail](#) **rep**
- ▶ K is a primary key for R1.

Question No: 16 (Marks: 1) - Please choose one

Making a change to the conceptual schema of a database but not affecting the existing external schemas is an example of

- ▶ Physical data independence.
- ▶ Concurrency control.
- ▶ **Logical data independence.** [Click here for detail](#) **rep**
- ▶ Functional dependency