



CS403 MID 2010 Solved paper B

Question No: 1 (M a r k s: 1)

User rights information is stored in

- ▶ Physical database
- ▶ Catalog
- ▶ Logical database
- ▶ Buffer

Question No: 2 (M a r k s: 1)

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.**
- ▶ Functional dependency

Question No: 3 (M a r k s: 1) <http://www.vchawk.com>

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)**

Question No: 4 (M a r k s: 1) <http://www.vchawk.com>

A relation (from the relational database model) consists of a set of tuples, which implies that **all tuples in a relation must be distinct.**

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 (M a r k s: 1)

Choose the symbol that corresponds to a discriminator attributes.

Question No: 6 (M a r k s: 1)

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

- ▶ NOT NULL
- ▶ **CHECK**
- ▶ FOREIGN KEY
- ▶ UNIQUE

Consider the following table obtained using Student and Instructor relations.

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

► **Instructor – Student**

- Student $\cap$ Instructor
- Instructor $\div$ Student
- Student – Instructor

Question No: 8 (M a r k s: 1) <http://www.vchawk.com>

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.**

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

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Question No: 9 (M a r k s: 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**

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

Not sure

<http://www.bit.lk/examination/s2/2006/IT2302-2006.pdf>

<http://athena.comp.rgu.ac.uk/staff/rab/Databases/Slides/Lecture7-EER-and-Advanced-Normalisation-print.pdf>

Question No: 10 (M a r k s: 1) <http://www.vchawk.com>

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.**

- 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 (M a r k s: 1)

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.**
- 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 (M a r k s: 1)

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

- ▶ Database
- ▶ DBMS
- ▶ **Data model**
- ▶ Data

Question No: 13 (M a r k s: 1) <http://www.vchawk.com>

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

- ▶ hyperlink
- ▶ **common attribute**
- ▶ primary key
- ▶ superkey

Question No: 14 (M a r k s: 1)

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

- ▶ specialization
- ▶ uniqueness
- ▶ inheritance
- ▶ **completeness**

completeness constraint—A constraint that specifies whether each entity supertype occurrence must also be a member of at least one subtype. The completeness constraint can be partial or total. Partial completeness means that not every supertype occurrence is a member of a subtype; that is, there may be some supertype occurrences that are not members of any subtype. Total completeness means that every supertype occurrence must be a member of at least one subtype

Question No: 15 (M a r k s: 1)

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

- ▶ hardware
- ▶ **software**
- ▶ computer infrastructure
- ▶ input and output

Question No: 16 (M a r k s: 1)

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

- ▶ **Full functional dependency**
- ▶ Any kind of dependency
- ▶ Transitive dependency
- ▶ Non-transitive dependency

Question No: 17 (M a r k s: 2) <http://www.vchawk.com>

What do you know about Insertion anomaly?

Insertion anomaly indicates that we cannot insert a fact about one entity until we have an additional fact about another entity.

Question No: 18 (M a r k s: 2)

Define **domain of an attribute**.

In computing, the attribute domain is the set of values allowed in an attribute. For the relational model it is a requirement that each part of a tuple be atomic. The

consequence is that each value in the tuple must be of some basic type, like a string or an integer. For the elementary type to be atomic it cannot be broken into more pieces.

Question No: 20 (Marks: 3)

Why do the relational data model considered as simple?

The relational model for database management is a database model based on first-order predicate logic. The relational model provides a declarative method for specifying data and queries: we directly state what information the database contains and what information we want from it, and let the database management system software take care of describing data structures for storing the data and retrieval procedures for getting queries answered.

Question No: 21 (Marks: 3)

What is the intersection operation in relational algebra?

The intersection operation also has the requirement that both the relations should be union compatible, which means they are of same degree and same domains. It is represented by $\cap$. If R and S are two relations and we take intersection of these two relations then the resulting relation would be the set of tuples, which are in both R and S. Just like union intersection is also commutative.

$R \cap S = S \cap R$

INTERSECTION Example

Question No: 23 (Marks: 5)

<http://www.vchhowk.com>

How to implement one-to-many relationship while designing tables?

If the primary key in a parent table matches multiple foreign keys in a child table, then the relationship is one-to-many. This relationship is common in database applications. For example, an application for a sports league might access a team table and a player table. Each team has multiple players, and each player belongs to a single team. Every row in the child table (player) has a foreign key identifying the player's team. This foreign key matches the team table's primary key.

When designing such entity beans, you must decide whether both tables are represented by entity beans, or just one.

<http://www.vchhowk.com>