MIDTERM EXAMINATION
Spring 2010
CS403- Database Management Systems (Session - 6)

Time: 60 min
M a r k s: 38

Question No: 1 (M a r k s: 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.**

Question No: 2 (M a r k s: 1)
The ER- data model is an example of:
- ► Physical database
- ► Logical database
- ► Relational database
- ► **Conceptual database**

Question No: 3 (M a r k s: 1)
Which one of the following E-R diagrams most correctly represents the relationship between Student and Grade entities?
- ►
- ►
- ►
- ►

right answer is 4

Question No: 4 (M a r k s: 1)

Which of the following constraints enforces referential integrity?

► **FOREIGN KEY**
► CHECK
► PRIMARY KEY
► UNIQUE

Question No: 5 (M a r k s: 1)

Given are the relations of student and Instructor

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?

Fname	Lname
Ajith	Gamage
Sujith	Hewage
Kasun	Peiris

► **Instructor – Student**
► Student ∩ Instructor
► Instructor ÷ Student
► Student – Instructor

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

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

Question No: 7 (M a r k s: 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.

Question No: 8 (M a r k s: 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.
► 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 (M a r k s: 1)

Identify the correct statement.

► Entity integrity constraints specify that primary key values can be composite.

► Entity integrity constraints are specified on individual relations.
► 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 (M a r k s: 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.

Question No: 11 (M a r k s: 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.

► 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 (M a r k s: 1)

A collection of related data is

► Logical model

► Database

► Data

► Relational model

Question No: 13 (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: 14 (M a r k s: 1)

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

► candidate key

► primary key

► superkey

► secondary key

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

State the two conditions which are imposed on candidate key?

1. **identifies the entity instances uniquely, in case of super key,**
2. **No proper subset of candidate key is a key.**

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

What is the importance of determining minimum cardinality in a relationship while designing database?

It is important to determine the minimum cardinality because it defines the way a database system will be implemented.

It shows us that how many instance of an entity can be placed in another relation at least.

Question No: 19 (M a r k s: 2)

What do you know about Insertion anomaly?

It is wrong state of database. It occurs when a new record is inserted in the relation. In this case the user cannot insert a fact about an entity until he has an additional fact about another entity.

Question No: 20 (M a r k s: 3)

Why do the relational data model considered as simple?

Because there is one structure and that is a relation (table).

Plus this single structure is very easy to understand. Due to which a user of a moderate knowledge can understand it easily.

It has strong math foundation which gives it extra strength.

Question No: 21 (M a r k s: 3)

Name the three different kinds of anomalies which can be eliminated through normalization?

1. Update anomaly .
2. Delete anomaly
3. Insert anomaly

.

Question No: 22 (M a r k s: 5)

The following diagram describes a part of an ER diagram.

Considering the above diagram, which of the given statements are True and which are False.

i-Entity2 is a weak entity. **True**

ii-Cardinality ratio for Entity1:Entity2 in Rel1 is 1:N. **True**

iii-Attrib6 represents an attribute which is having composite nature. **False**
iv-Attrib3 is a kind of a derived attributes. **True**
v-Entity2 is participating totally in the Rel1 relationship**. True**

Question No: 23 (M a r k s: 5)
Consider the relation R with four attributes A,B,C and D and the functional dependencies
(A,B) -> (C,D) and
C -> D .

a)The above relation is a normalized relation upto which normal form?

2NF
b)Write the PK of relation R

Answer:
A,B composite is the primary key