

Started on Tuesday, 3 December 2024, 14:16

State Finished

Completed on Tuesday, 3 December 2024, 15:17

Time taken 1 hour

Question 1

Correct

Marked out of 5.00

By converting an E R diagram to a real database schema, One to many relationships in the diagram will become:

- ☐ a. Attributes
- ☐ b. Primary keys
- ☐ c. Unique keys
- ☐ d. Tables
- ☒ e. Foreign keys ✓

The correct answer is:

Foreign keys

Question 2

Correct

Marked out of 10.00

Given a table T (a, b, c, d, e, f, g) with (a, b, e) being the primary key. Which of the following statement(s) is/are correct?

- ☒ a. Functional dependency $d \twoheadrightarrow c, f, g$ is a transitive dependency. ✓
- ☐ b. Functional dependency $c \twoheadrightarrow d$ is a partial dependency.
- ☐ c. Functional dependency $g \twoheadrightarrow b$ is a partial dependency.
- ☒ d. Functional dependency $a, b \twoheadrightarrow c$ is a partial dependency. ✓
- ☒ e. Functional dependency $c \twoheadrightarrow d$ is a transitive dependency. ✓

The correct answers are:

Functional dependency $a, b \twoheadrightarrow c$ is a partial dependency.,

Functional dependency $c \twoheadrightarrow d$ is a transitive dependency.,

Functional dependency $d \twoheadrightarrow c, f, g$ is a transitive dependency.

Question 3

Correct

Marked out of 5.00

Which SQL JOIN type returns all rows from BOTH tables, filling in NULL values for non-matching rows?

- ☐ a. INNER JOIN
- ☐ b. RIGHT OUTER JOIN
- ☐ c. LEFT OUTER JOIN
- ☒ d. FULL OUTER JOIN ✓

The correct answer is:

FULL OUTER JOIN

Question 4

Correct

Marked out of 6.00

Staff			
ID	Name	Salary	Department
M139	John Smith	18000	Marketing
M140	Mary Jones	22000	Marketing
A368	Jane Brown	22000	Accounts
P222	Mark Brown	24000	Personnel
A367	David Jones	20000	Accounts

Given a table called Staff, which of the following statements are correct?

- ☐ a. The cardinality of this table is 4.
- ☒ b. Creating another table called "Members" with the same column "ID" in this database is allowed. ✓
- ☒ c. The cardinality of this table is 5. ✓
- ☒ d. Each tuple of this table refers to the data of one staff member. ✓
- ☐ e. Creating another table called "Members" with the same column "ID" in this database is not allowed.

The correct answers are:

The cardinality of this table is 5.,

Each tuple of this table refers to the data of one staff member.,

Creating another table called "Members" with the same column "ID" in this database is allowed.

Question 5

Partially correct

Marked out of 10.00

Which of the following statements can get the list of staff member(s) who is of the same age as another staff in the same table? Table: Staff (staffID, age).

- ☐ a. SELECT DISTINCT s1.staffID FROM Staff s1, Staff s2 WHERE s1.staffID = s2.staffID AND s1.age = s2.age;
- ☐ b. SELECT DISTINCT staffID FROM Staff WHERE age = ANY (SELECT age FROM Staff);
- ☐ c. SELECT DISTINCT staffID FROM Staff s1 WHERE age IN (SELECT age FROM Staff s2 WHERE s1.staffID <> s2.staffID);
- ☒ d. SELECT DISTINCT s1.staffID FROM staff s1, staff s2 WHERE s1.age = s2.age AND s1.staffID <> s2.staffID; ✓

The correct answers are:

SELECT DISTINCT staffID FROM Staff s1 WHERE age IN (SELECT age FROM Staff s2 WHERE s1.staffID <> s2.staffID);,

SELECT DISTINCT s1.staffID FROM staff s1, staff s2 WHERE s1.age = s2.age AND s1.staffID <> s2.staffID;

Question 6

Correct

Marked out of 5.00

SQL stands for:

- ☒ a. Structured Query Language. ✓
- ☐ b. Sequential Query Language.
- ☐ c. Synchronized Query Language.
- ☐ d. Standard Query Language.

The correct answer is:

Structured Query Language.

Question 7

Correct

Marked out of 6.00

Which of the following statement(s) is/are correct?

- ☒ a. When defining a column of a table, providing its datatype is mandatory. ✓
- ☒ b. When creating a table, the backticks (`) surrounding the table name is optional if the table name does not contain spaces. ✓
- ☐ c. When creating a table, the backticks (`) surrounding the table name is mandatory if the table name does not contain spaces.
- ☐ d. When defining a column of a table, providing its datatype is optional.
- ☒ e. Table constraints are optional in CREATE TABLE statements. ✓
- ☐ f. Table constraints are mandatory in CREATE TABLE statements.

The correct answers are:

When defining a column of a table, providing its datatype is mandatory.,

When creating a table, the backticks (`) surrounding the table name is optional if the table name does not contain spaces.,

Table constraints are optional in CREATE TABLE statements.

Question 8

Correct

Marked out of 6.00

Which syntax below is/are able to change the datatype of an existing column?

- ☒ a. ALTER TABLE ... CHANGE COLUMN ... ✓
- ☐ b. UPDATE TABLE ... MODIFY COLUMN ...
- ☒ c. ALTER TABLE ... MODIFY COLUMN ... ✓
- ☐ d. ALTER TABLE ... ALTER COLUMN ...
- ☐ e. ALTER TABLE ... UPDATE COLUMN ...
- ☐ f. UPDATE TABLE ... CHANGE COLUMN ...

The correct answers are:

ALTER TABLE ... MODIFY COLUMN ...,

ALTER TABLE ... CHANGE COLUMN ...

Question 9

Incorrect

Marked out of 12.00

Given the table t's definition below:

```
CREATE TABLE t (  
  a VARCHAR(200)  
);
```

Which of the following insertion statements have correct string format? (There's no double quote character in this question)

- ☒ a. INSERT INTO t VALUES ('single quote'); ✓
- ☐ b. INSERT INTO t VALUES ('backtick');
- ☒ c. INSERT INTO t VALUES ('Mary O'Brien'); ✗
- ☐ d. INSERT INTO t VALUES ("");
- ☐ e. INSERT INTO t VALUES ('John"s Office');
- ☐ f. INSERT INTO t VALUES ('Mary O\'Brien');
- ☐ g. INSERT INTO t VALUES ('John"s Office');

The correct answers are:

```
INSERT INTO t VALUES ('single quote');
```

```
INSERT INTO t VALUES ("");
```

```
INSERT INTO t VALUES ('John"s Office');
```

```
INSERT INTO t VALUES ('Mary O\'Brien');
```

Question 10

Correct

Marked out of 12.00

Given table t below, assume that all columns have INT data type.

a	b	c
1	3	5
2	2	6
1	7	3
4	2	5

After executing:

```
SELECT b, a AS c FROM t WHERE a <> b ORDER BY b;
```

The resulting table is:

b	c
<input type="text" value="2"/> ✓	<input type="text" value="4"/> ✓
<input type="text" value="3"/> ✓	<input type="text" value="1"/> ✓
<input type="text" value="7"/> ✓	<input type="text" value="1"/> ✓

After executing:

```
SELECT a,b,c*2 FROM t WHERE a + b > c ORDER BY a;
```

The resulting table is:

a	b	c*2
<input type="text" value="1"/> ✓	<input type="text" value="7"/> ✓	<input type="text" value="6"/> ✓
<input type="text" value="4"/> ✓	<input type="text" value="2"/> ✓	<input type="text" value="10"/> ✓

Question 11

Correct

Marked out of 10.00

Which of the following statement(s) is/are correct when defining a foreign key?

- ☒ a. The data types of referenced columns and referencing columns must be compatible. ✓
- ☒ b. The number of attributes involved with the foreign key in the referencing table should be the same as the number of attributes in the referenced table. ✓
- ☐ c. A foreign key can still be applied when existing data will violate this foreign key.
- ☐ d. Referenced columns and referencing columns cannot be in a same table.
- ☒ e. A table can have multiple foreign keys. ✓

The correct answers are:

The data types of referenced columns and referencing columns must be compatible.,

The number of attributes involved with the foreign key in the referencing table should be the same as the number of attributes in the referenced table.,

A table can have multiple foreign keys.

Question 12

Correct

Marked out of 5.00

Which one of the following tables is in the third normal form?

- ☐ a. table (a, b, c, d) with primary key (a, b) and extra dependencies $b \twoheadrightarrow c$
- ☐ b. table (a, b, c, d) with primary key (a) and extra dependencies $b \twoheadrightarrow c$
- ☐ c. table (a, b, c, d) with primary key (a, b) and extra dependencies $c \twoheadrightarrow d$
- ☒ d. table (a, b, c, d) with primary key (a) and extra dependencies $c \twoheadrightarrow a$ ✓

The correct answer is:

table (a, b, c, d) with primary key (a) and extra dependencies $c \twoheadrightarrow a$

Question 13

Correct

Marked out of 8.00

Given tables r and s shown below

r		s	
a	b	c	d
1	2	2	1
3	4	3	1

After executing "SELECT * FROM r, s ORDER BY a;", which of the following statement(s) is/are correct?

- ☐ a. The result has 2 tuples.
- ☒ b. The result contains tuple (1, 2, 2, 1); ✓
- ☐ c. The result contains tuple (1, 3, 2, 3);
- ☒ d. The result contains tuple (3, 4, 2, 1); ✓
- ☒ e. The result has 4 attributes. ✓

The correct answers are:

The result has 4 attributes.,

The result contains tuple (1, 2, 2, 1);,

The result contains tuple (3, 4, 2, 1);

Question 14

Correct

Marked out of 6.00

Which one(s) of the following statements calculates students' individual average marks? Assume that each student may take up to 7 modules.

Table: Marks (studentID, module, mark)

- ☒ a. SELECT studentID, avg(mark) FROM Marks GROUP BY studentID. ✓
- ☐ b. SELECT studentID, sum(mark)/7 FROM Marks GROUP BY studentID.
- ☐ c. SELECT studentID, average(mark) FROM Marks GROUP BY studentID.
- ☐ d. SELECT studentID, avg(mark) FROM Marks GROUP BY module.

The correct answer is:

SELECT studentID, avg(mark) FROM Marks GROUP BY studentID.

Question 15

Partially correct

Marked out of 10.00

Given a table T (a, b, c, d, e, f, g) with (a, b) being the primary key and the following additional functional dependencies:

b → c, d

e → f, g

d → b

After normalizing this table to 3NF, which of the following tables are not in the result?

- ☐ a. Table (a, b, e) with primary key (a, b)
- ☐ b. Table (e, f, g) with primary key (e)
- ☐ c. Table (a, b, e) with primary key (a, b)
- ☐ d. Table (d, b) with primary key (d)
- ☒ e. Table (b, c) with primary key (b) ✓

The correct answers are:

Table (b, c) with primary key (b),

Table (d, b) with primary key (d)

Question 16

Correct

Marked out of 10.00

T				
a	b	c	d	e
1	2	5	6	NULL
1	1	5	3	6
1	2	NULL	1	7

Given the table T above and only considering its current data, which of the following columns or column combinations can become a primary key?

- ☐ a. (b, c, d)
- ☒ b. (a, d) ✓
- ☒ c. (a, b, d) ✓
- ☐ d. (a)
- ☐ e. (a, b, c)
- ☒ f. (d) ✓
- ☐ g. (a, e)
- ☒ h. (b, d) ✓
- ☐ i. (a, b)

The correct answers are:

(d),

(a, d),

(b, d),

(a, b, d)

Question 17

Partially correct

Marked out of 6.00

staffNo	fName	lName	position	sex	DOB	salary	branchNo
SL21	John	White	Manager	M	1-Oct-45	30000	B005
SG37	Ann	Beech	Assistant	F	10-Nov-60	12000	B003
SG14	David	Ford	Supervisor	M	24-Mar-58	18000	B003
SA9	Mary	Howe	Assistant	F	19-Feb-70	9000	B007
SG5	Susan	Brand	Manager	F	3-Jun-40	24000	B003
SL41	Julie	Lee	Assistant	F	13-Jun-65	9000	B005

Given the table "staff" above with primary key (staffNo), which of the following statement(s) is/are correct?

- ☐ a. Given any possible tuples in this table, you can never find the same combination of (fName, lName)
- ☒ b. (staffNo, branchNo) is a candidate key. ✖
- ☒ c. Given any possible tuples in this table, you can never find the same combination of (staffNo, sex) ✔
- ☒ d. (staffNo, branchNo) is a super key. ✔

The correct answers are:

(staffNo, branchNo) is a super key.,

Given any possible tuples in this table, you can never find the same combination of (staffNo, sex)

Question 18

Incorrect

Marked out of 5.00

"Each lecturer only teaches one module. Some modules have co teachers", what is the cardinality ratio of lecturer and module?

- ☐ a. Many to many
- ☐ b. One to many
- ☒ c. All other options are incorrect. ✖
- ☐ d. One to one

The correct answer is:

One to many

Question 19

Correct

Marked out of 5.00

Which one of the following statements is WRONG about functional dependency?

- ☐ a. A table with its primary key applied on a single column may have transitive dependencies.
- ☐ b. A table with its primary key applied on a single column may have partial dependencies.
- ☐ c. A table with its primary key applied on multiple columns may have transitive dependencies.
- ☒ d. A table with its primary key applied on a single column may have partial dependencies. ✓

The correct answers are:

A table with its primary key applied on a single column may have partial dependencies.,

A table with its primary key applied on a single column may have partial dependencies.

Question 20

Correct

Marked out of 5.00

Which of the following item(s) is/are valid data models of database?

- ☒ a. Relational data model ✓
- ☒ b. Hierarchical data model ✓
- ☐ c. Reversed context data model
- ☒ d. Document model ✓

The correct answers are:

Relational data model,

Hierarchical data model,

Document model

Question 21

Partially correct

Marked out of 5.00

Which of the following SELECT statement can be executed without errors? Assume all tables and attributes in the statements exist.

- ☐ a. SELECT * FROM persons WHERE age < avg(age);
- ☒ b. SELECT avg(age) FROM persons; ✓
- ☐ c. SELECT avg(age) AS x FROM persons GROUP BY id HAVING x > 25;
- ☐ d. SELECT avg(age) AS x FROM persons GROUP BY id WHERE x > 25;
- ☒ e. SELECT avg(age) AS x FROM persons WHERE age > 25 GROUP BY id; ✓

The correct answers are:

SELECT avg(age) FROM persons;;

SELECT avg(age) AS x FROM persons GROUP BY id HAVING x > 25,;

SELECT avg(age) AS x FROM persons WHERE age > 25 GROUP BY id;

Question 22

Correct

Marked out of 14.00

Given the 3 valued logic expressions below, calculate their final results and write down the corresponding logic value of the result (Unknown/True/False):

True AND (Unknown + 1) --> ✓

False OR Unknown --> ✓

(False OR True) OR Unknown --> ✓

(False AND Unknown) OR 1 --> ✓

(Unknown + 1) + False --> ✓

(1 + False) + True --> ✓

(Unknown * 12) OR (True OR Unknown) --> ✓

Question 23

Partially correct

Marked out of 6.00

Viewing

clientNo	propertyNo	viewDate	comment
CR56	PA14	24-May-13	too small
CR76	PG4	20-Apr-13	too remote
CR56	PG4	26-May-13	
CR62	PA14	14-May-13	no dining room
CR56	PG36	28-Apr-13	

Given the table "Viewing" and its current data shown above, which statement(s) below is/are correct?

- ☐ a. CHAR(2) is capable of fitting all data currently in the column (clientNo).
- ☒ b. The suitable datatype for column (viewDate) is VARCHAR. ✓
- ☐ c. The suitable datatype for column (viewDate) is DATE.
- ☐ d. The suitable datatype for column (viewDate) is DATETIME.
- ☒ e. CHAR(5) is capable of fitting all data currently in the column (clientNo). ✓

The correct answers are:

CHAR(5) is capable of fitting all data currently in the column (clientNo),

The suitable datatype for column (viewDate) is DATE.,

The suitable datatype for column (viewDate) is DATETIME.,

The suitable datatype for column (viewDate) is VARCHAR.

Question 24

Correct

Marked out of 10.00

Given table T(a, b, c) and three separate UNIQUE keys (a), (b) and (c), which of the following statement(s) is/are correct? Assume that all columns are of type INT.

T		
a	b	c
1	2	3
4	5	6

- ☐ a. One can insert (2, 5, 7) into T.
- ☐ b. One can insert (1, 4, 7) into T.
- ☒ c. One can insert (2, 6, 4) into T. ✓
- ☐ d. One can insert (4, 3, 1) into T.
- ☒ e. One can insert (2, 4, 7) into T. ✓

The correct answers are:

One can insert (2, 4, 7) into T.,

One can insert (2, 6, 4) into T.

Question 25

Correct

Marked out of 10.00

CREATE TABLE persons (id INT PRIMARY KEY, name VARCHAR(200) NOT NULL, age INT, tel INT);

persons			
id	name	age	tel
1	John	25	4712
2	George	22	6019
3	Maria	36	80114427
4	Lee	50	80193959
5	Murray	24	3717
6	Henry	0	6512

Complete the following statement that removes all persons whose name contains letter "j" and older than 25.

DELETE FROM persons WHERE name LIKE ' %j%' and age > 25;

Complete the following statement that updates Jason's ID to 19, age to 21 and phone number to 55227272.

UPDATE persons SET ID = 19, age = 21, tel = 55227272 WHERE name = 'Jason';

Question 26

Partially correct

Marked out of 8.00

Given the definition of table y and its current data:

CREATE TABLE y (
c1 INT UNIQUE NOT NULL,
c2 VARCHAR(5) UNIQUE,
c3 INT DEFAULT 12,
c4 INT NOT NULL
);

y			
c1	c2	c3	c4
9	x'	2	1

Complete the INSERTION statement below that inserts this piece of data: INSERT INTO y (c2, c1, c3, c4) VALUES (9, 'x', 2, 1)