

EASTERN MEDITERRANEAN UNIVERSITY
DEPARTMENT OF COMPUTER ENGINEERING

CMPE353/CMSE351

Midterm Examination Multiple Choice Study Questions

Prof. Dr. Ekrem Varođlu

Q1. Database _____ is the logical design of the database, whereas database _____ contains a snapshot of the data in the database at a given instant in time.

- a) Instance, Schema
- b) Relation, Schema
- c) Relation, Domain
- d) Schema, Instance

Q2. Which one of the following attributes is more likely to be selected as the primary key for a relation which contains data about a student?

- a) Name
- b) Street
- c) Id
- d) Department

Q3. An attribute in a relation can be used as a foreign key if the _____ key from another relation is used as an attribute in that relation.

- a) Candidate
- b) Primary
- c) Super
- d) Sub

Q4. What type of a statement is?

```
CREATE TABLE student (name VARCHAR, id INTEGER)
```

- a) DML
- b) DDL
- c) View
- d) Integrity constraint

Q5. Which of the following queries given below can replace the query:

```
SELECT name, course_id  
FROM instructor, teaches  
WHERE instructor_ID= teaches_ID;
```

- a) Select name, course_id from teaches, instructor where instructor_id=course_id;
- b) Select name, course_id from instructor natural inner join teaches;
- c) Select name, course_id from instructor;
- d) Select course_id from instructor join teaches;

Q6. Given the relation employee(id, name, salary, dept_id). Which of the following columns are displayed as output following the query:

```
SELECT * FROM employee WHERE salary>10000 AND dept_id=101;
```

- a) Salary, dept_id
- b) Employee
- c) Salary
- d) All the columns of employee relation

Q7. Which of the following statements contains an error?

- a) Select * from student where id = 101;
- b) Select id from student where id = 106;
- c) Select id from student;
- d) Select id where id = 119 and name = 'Jane';

Q8. Which one of the following has to be inserted into the blank to select the dept_name which has Computer Engineering as its ending string in the following query?

```
SELECT emp_name  
FROM department  
WHERE dept_name LIKE ' _____ Computer Engineering';
```

- a) %
- b) _
- c) ||
- d) \$

Q9. Which of the following queries given below can replace the query:

```
SELECT name  
FROM instructor  
WHERE salary <= 100000 AND salary >= 90000;
```

a)
SELECT name
FROM instructor
WHERE salary BETWEEN 90000 AND 100000;

b)
SELECT name
FROM employee
WHERE salary <= 90000 AND salary >= 100000;

c)
SELECT name
FROM employee
WHERE salary BETWEEN 90000 AND 100000;

d)
SELECT name
FROM instructor
WHERE salary BETWEEN 100000 AND 90000;

Q10. The union operation automatically _____.

- a) Adds tuples into a table
- b) Eliminates unique tuples
- c) Adds common tuples
- d) Eliminates duplicate tuples

Q11. Consider the query given below. After execution, this query will display;

```
(SELECT emp_id  
FROM employee  
WHERE dept = 'Toys')  
EXCEPT  
(SELECT emp_id  
FROM employee  
WHERE dept = 'Cars');
```

- a) Only tuples from the second part
- b) Tuples from the first part which are also present in the second part
- c) Tuples from both parts
- d) Tuples from the first part but not tuples from the second part

Q12. Suppose the attribute phone number is included in a relation, however some phone numbers are not known during first data entry. The missing values will be given as:

- a) 0
- b) Unknown
- c) Null
- d) Empty space

Q13. The primary key attribute must be:

- a) Unique
- b) Not null
- c) Both Unique and Not null
- d) Either Unique or Not null

Q14. Consider the following query:

```
SELECT COUNT (____ ID)
FROM student
WHERE semester = 'Spring' AND YEAR = 2020;
```

We must use the keyword _____ in the aggregate expression if we want to eliminate duplicates.

- a) Distinct
- b) Count
- c) Avg
- d) Primary key

Q15. The phrase “greater than at least one” is represented in SQL by _____.

- a) < all
- b) < some
- c) > all
- d) > some

Q16. Which one of the following deletes all the entries but keeps the structure of the relation?

- a) Delete from r where P;
- b) Delete from instructor where dept name= 'Finance';
- c) Delete from instructor where salary between 13000 and 15000;
- d) Delete from instructor;

Q17. Which of the following is used to insert a tuple from another relation?

- a)
INSERT INTO course (course id, title, dept name, credits)
VALUES ('CS-437', 'DATABASE Systems', 'Comp. Sci.', 4);
- b)
INSERT INTO instructor
SELECT ID, name, dept name, 18000
FROM student
WHERE dept name = 'Music' AND tot cred > 144;
- c)
INSERT INTO course VALUES ('CS-437', 'DATABASE Systems', 'Comp. Sci.', 4);

d) It is not possible to insert a tuple from another relation.

Q18. What type of join is used when we want to include rows that do not have matching values?

- a) Equi-join
- b) Natural join
- c) Outer join
- d) All of the above

Q19. Which of the following is the correct syntax for declaring a view where v is view name?

- a) Create view v as "query name";
- b) Create "query expression" as view;
- c) Create view v as "query expression";
- d) Create view "query expression";

Q20. Consider the following query:

```
CREATE TABLE Manager(ID NUMERIC,Name VARCHAR(20),budget NUMERIC,Details VARCHAR(30));
```

Which of the following integrity constraints should be used to ensure that the value of attribute budget is non-negative?

- a) Check(budget>0)
- b) Check(budget<0)
- c) Alter(budget>0)
- d) Alter(budget<0)

Q21. Consider the incomplete schema definition below:

```
CREATE TABLE course  
( ...  
FOREIGN KEY (dept name) REFERENCES department  
... );
```

Which of the following should be used to delete the entries in the referenced table when a

tuple is deleted in the course table?

- a) Delete
- b) On delete cascade**
- c) On delete set null
- d) All of the above

Q22. Which of the following is used to provide a delete authorization to a subset of users named instructor?

- a)
CREATE ROLE instructor ;
GRANT DELETE TO instructor;
- b)
CREATE ROLE instructor;
GRANT SELECT ON takes TO instructor;
- c)
CREATE ROLE instructor;
GRANT DELETE ON takes TO instructor;**
- d) All of the above

Q23. If we wish to grant a privilege to a set of users and also want to allow the recipients to pass the privilege on to other users, we append the _____ clause to the appropriate grant command.

- a) With grant
- b) Grant user
- c) Grant pass privilege
- d) With grant option**

Q24. _____ are a special kind of a stored procedure that executes in response to a certain action on a table like insertion, deletion or update of data.

- a) Procedures
- b) Triggers**
- c) Functions
- d) None of the mentioned

Q25)

Given the following relational instances of R and S;

R

A	B	C
1	1	1
1	2	3
2	1	1
2	3	4
1	2	2
2	2	2

S

B	C
1	1
2	2

If the relational algebra expression $R \text{ op } S$ generates the table

A
1
2

Then, *op* stands for:

- a) Set intersection
- b) Set difference
- c) Selection
- d) Division

Q26)

Given the following relational instances of R and S:

R

A	B
3	3
6	4
2	3
3	5
3	6

S

B	C	D
5	1	6
3	3	5
4	3	1

Assuming each record has the schema (A, B, C, D), which of the following records will be in the result for $\sigma_{A=3}(R) \bowtie \sigma_{B=3 \vee B=4}(S)$?

- (a) (3, 3, 1, 6)
- (b) (6, 4, 4, 1)
- (c) (3, 3, 3, 5)
- (d) (2, 3, 3, 5)

Q27.

Given the following relational instances of R and S:

R

A	B
3	3
6	4
2	3
3	5
3	6

S

B	C	D
5	1	6
3	3	5
4	3	1

Which of the following records will be in the result of $\pi_{C,D}(S) \cap \pi_{A,B}(R)$?

(a) (1, 6)

(b) (6, 4)

(c) (3, 3)

(d) (3, 5)

Q28

Given the following relational instances of R and S:

R

A	B
3	3
6	4
2	3
3	5
3	6

S

B	C	D
5	1	6
3	3	5
4	3	1

Which of the following records will be in the result of $\pi_B(S) - \pi_B(R)$?

(a) empty set

(b) (3,4)

(c) (3)

(d) (6)

Q29. Which of the following relational algebra operators correspond to the select clause in SQL?

(a) selection

(b) projection

(c) set union

(d) cartesian product

Q30.

Which of the following SQL queries below correspond to the relational algebra expression:

$$\prod_{A,B} \sigma_{r.A=2}(r \times s)$$

a) project a,b

from r,s
where r.A=2

b) select a,b

from r,s
where r.A=2

c) select a,b

from r and s
where r.A=2

d) select a,b

from r natural inner join s
where r.A=2

Relational Algebra

Consider the following schema definitions where the underlined attributes represent the primary keys.

branch (branch_name, branch_city, assets)
customer (customer_name, customer_street, customer_city)
account (account_number, branch_name, balance)
loan (loan_number, branch_name, amount)
depositor (customer_name, account_number)
borrower (customer_name, loan_number)

Q1)

This query finds the branch names which are located in London.

Which of the following correctly replaces P and R?

$$\Pi_{\text{branch_name}} (\sigma_P (R))$$

- a) P: branch= "London", R: branch_city
- b) P: branch_city="London", R: branch
- c) P: London", R: branch
- d) P: branch_city, R: branch

Q2)

This relational algebra query finds the names of customers who have a loan greater than \$500.

Which of the following correctly replaces P and R?

$$\Pi_{\text{customer_name}} (\sigma_P (R))$$

- a) P: amount>500, R: loan x customer
- b) P: amount>500, R: loan x borrower
- c) P: amount>500 ^ loan.loan_number=borrower.loan_number, R: loan x borrower
- d) P: amount>500 ^ customer.customer_name=borrower.customer_name, R: customer x borrower

Q3)

This relational algebra query finds how many customers live on each street in Paris.

Which of the following correctly replaces P?

$P (\sigma_{\text{customer_city}=\text{"Paris"}}(\text{customer}))$

- a) $\text{customer_street } \mathbf{G} \text{ count}(\text{customer_name})$
- b) $\text{customer_street } \mathbf{G} \text{ sum}(\text{customer_name})$
- c) $\text{customer_name } \mathbf{G} \text{ count}(\text{customer_street})$
- d) $\text{city } \mathbf{G} \text{ count}(\text{customer})$

Q4) (2 pts)

The following relational algebra query finds the names of customers who have both a loan and an account.

Which of the following correctly replaces R?

$\Pi_{\text{customer_name}} (\sigma_{\text{depositor.customer_name} = \text{borrower.customer_name}} (R))$

- a) $\text{borrower } \times \text{ depositor}$
- b) $\text{borrower } \cup \text{ depositor}$
- c) $\text{borrower } \cap \text{ depositor}$
- d) $\text{borrower } \wedge \text{ depositor}$

Q5)

The following relational algebra query finds the largest balance.

Which of the following correctly replaces P and R?

$P ((R))$

- a) $P: \mathbf{G} \text{ max}(\text{balance}), R: \text{account}$
- b) $P: \mathbf{G} \text{ max}(\text{amount}), R: \text{loan}$

- c) P: branch_name \mathbf{G} max(balance), R: account
- d) P: branch_name \mathbf{G} max(amount), R: loan

Q6)

The following relational algebra expression increases all loan amounts by 20%.

Which of the following correctly replaces P and R?

$$\text{loan} \leftarrow \Pi_P (R)$$

- a) P: loan_number,branch_name,amount*1.2, R: loan
- b) P: amount*1.2, R: loan
- c) P: loan_number,branch_name, R: amount*1.2
- d) P: loan, R: loan_number,branch_name,amount*1.2

Q7)

The following relational algebra expression deletes all accounts in the Palm Springs branch.

Which of the following correctly replaces R and S?

$$\text{account} \leftarrow R - (\sigma_{\text{branch_name}=\text{"Palm Springs"}} (S))$$

- a) R: account, S: account
- b) R: account, S: branch
- c) R: branch, S: account
- d) R: loan, S: branch

Q8)

Consider the following relational algebra expressions E1, E2 and E3 below. In which of these expressions are the duplicates eliminated?

E1: $\Pi_{\text{customer_name}}(\text{depositor})$

E2: $\Pi_{\text{account_number}}(\text{depositor})$

E3: $\Pi_{\text{customer_name}, \text{account_number}}(\text{depositor})$

- a) All of them
- b) E1 only
- c) E2 only
- d) E3 only

Q9)

Which of the following may be the reason for the composite primary key for table depositor?

- i) A customer may have several accounts
- ii) An account may be shared by different customers
- iii) An account may be at different branches

- a) i) and ii)
- b) i) only
- c) ii) only
- d) i), ii) and iii)

Q10)

Which of the following is a correct foreign key definition?

- i) account_number in table account is a foreign key referencing table depositor
- ii) account_number in table account is a foreign key referencing table borrower
- iii) account_number in table depositor is a foreign key referencing table account
- iv) loan_number in table borrower is a foreign key referencing table loan

- a) iii) and iv) only
- b) all are correct
- c) i) and ii) only
- d) i) and iv) only

SQL Questions

Consider the following schema definitions where the underlined attributes represent the primary keys.

Company (compNo, street, city, state)
Staff (staffNo, fName, lName, position, salary, compNo)
CarforRent (carNo, model, type, color, price, staffNo, compNo)
Customer (custNo, fName, lName, telNo)
Rented (custNo, carNo, rentDate)

Q11)

The following SQL query lists the staff with a salary between \$100 and \$200 (both values inclusive) in descending order.

Which of the following correctly replaces A and B?

```
SELECT staff_no , salary  
FROM Staff  
WHERE A  
B
```

- a) A: salary BETWEEN 100 and 200, B: ORDER BY salary DESC
- b) A: salary BETWEEN 100 and 200, B: GROUP BY salary DESC
- c) A: salary > 100 and SALARY < 200, B: ORDER BY salary DESC
- d) A: salary BETWEEN 100 and 200, B: ORDER BY salary

Q12)

The following SQL query finds how many different cars were rented in January 2021.

Which of the following correctly replaces A and B?

```
SELECT A
FROM B
WHERE rentDate BETWEEN '1-Jan-2021' AND 31-Jan-2021'
```

- a) A: count (distinct car_no), B: rented
- b) A: count (car_no), B: rented
- c) A: count (distinct car_no), B: CarforRent
- d) A: count (car_no), B: CarforRent

Q13) (2 pts)

The following SQL query lists the number of workers for each company with more than 15 staff together with the sum of salaries for that company.

Which of the following correctly replaces A,B, and C?

```
SELECT A, B, sum (salary)
FROM Staff
GROUP BY compNo
C
```

- a) A: comp_no, B:count(staff_no), C:HAVING count (staff_no) > 15
- b) A: staff_no, B:count(staff_no), C:HAVING count (staff_no) > 15
- c) A: comp_no, B:count(staff_no), C:WHERE count (staff_no) > 15
- d) A: staff_no, B:count(staff_no), C:HAVING count (comp_no) > 15

Q14)

The following SQL query lists the customers who have rented a car only (some customers may be registered to the database but never rented a car).

Which of the following correctly replaces A?

```
SELECT custNo, fName, lName
```

A

- a) FROM customer natural inner join rented
- b) FROM customer, rented
- c) FROM rented WHERE cust_no IS NOT NULL
- d) FROM customer natural left outer join rented

Consider the following schema definitions involving matches, players and referees for the European Football Association.

player (playerid, playername, country, position, p_age)

referee (refid, refname, league, ref_age)

match (matchid, league, matchdefinition)

player_record (playerid, matchid, season, goals)

ref_match (refid, matchid, season)

Assume that there is only one referee assigned for each match. Furthermore, matchids are unique within a given season but they repeat for different seasons.

Q15) (2 pts)

The following SQL query lists the names of all players who did not play in any of the matches.

Which of the following correctly replaces A,B, and C?

```
select playername
from player
where A ( select B from C )
```

- a) A: playerid NOT IN, B: playerid, C: player_record
- b) A: playerid NOT IN, B: playerid, C: player
- c) A: playerid !=, B: playerid, C: player_record
- d) A: playername NOT IN, B: playername, C: player

Q16) (2 pts)

The following SQL query lists the names and ages of the youngest referees in the 'Premier League'

Which of the following correctly replaces A,B, and C?

```
select refname, ref_age
from A
where league = 'Premier League' AND
      B ( select C from referee where league = 'Premier League' )
```

- a) A: referee, B: ref_age=, C: min(ref_age)
- b) A: ref_match, B: ref_age=, C: min(ref_age)
- c) A: referee, B: ref_age IN, C: ref_age
- d) A: referee, B: ref_age=, C: distinct ref_age

Consider the following schema definition where the underlined attribute represents the primary key.

stock (code, firm, price, quantity)

Q17)

The following SQL statements updates the stock table when 100 items with code A1 is sold.

Which of the following correctly replaces A, B and C?

A stock

SET B

C

- a) A:update, B: quantity=quantity-100, C: where code=A1
- b) A:update, B: quantity=quantity-100, C: having code=A1
- c) A:update, B: quantity=100, C: where code=A1
- d) A:delete from, B: quantity=quantity-100, C: where code=A1

Q18)

The following SQL statements delete the product with code A1 from the stock table.

Which of the following correctly replaces A and B?

A stock

B

- a) A: delete from, B: where code=A1
- b) A: drop from, B: where code=A1
- c) A: update, B: where code=A1
- d) A: delete from, B: having code=A1

Q19) (2 pts)

Consider the relation

school(id, name, number_of_teachers, min_number_of_teachers, number_of_students)

When some teachers are laid off and the number of teachers drops below a previously set minimum value, the following SQL row level trigger makes sure that the number of teachers is set to this minimum value.

Which of the following correctly replaces A, B and C?

Create trigger CannotFireTeachers

AFTER UPDATE OF school ON no_of_teachers

REFERENCING newrow as nrow

FOR EACH ROW

WHEN A

BEGIN ATOMIC

 UPDATE school

 SET B

 WHERE C

END

a) A: nrow.number_of_teachers < min_number_of_teachers,

B: number_of_teachers=min_number_of_teachers

C: id=nrow.id

b) A: number_of_teachers < min_number_of_teachers,

B: number_of_teachers=min_number_of_teachers

C: id=id

c) A: nrow.number_of_teachers < min_number_of_teachers,

B: number_of_teachers= number_of_teachers

C: id=nrow.id

d) A: number_of_teachers < min_number_of_teachers,

B: min_number_of_teachers=number_of_teachers

C: id=nrow.id

Q20)

Consider the table

Library (cat_no, name, author)

Which of the following SQL statements gives the user U1 the privilege to read from this table as well as pass this privilege to other users?

- a) Grant select on library to U1 with grant option
- b) Grant select on library to U1
- c) Grant read on library to U1 with grant option
- d) Revoke select on library from U1 cascade

Q21)

```
SELECT * FROM R
```

What type of statement is this?

- a) DML
- b) DDL
- c) View
- d) Integrity constraint

Q22) Which command do we use to remove a table from the database?

- a) Delete table
- b) Vanish table
- c) Remove table
- d) Drop table

Q23)

Which of the following constraints must be used to make sure that an attribute always has a value?

- a) Null
- b) Not null
- c) Unique
- d) Distinct

Q24)

Which of the following is the syntax for views where v is view name?

- a) Create view v as "query name"
- b) Create "query expression" as view
- c) Create view v as "query expression"
- d) Create view "query expression"

Q25)

CREATE TABLE course

(...

FOREIGN KEY (dept name) REFERENCES department

...)

Which of the following is used to delete the entries in the department table when the tuple is deleted in course table?

- a) Delete
- b) On delete cascade
- c) On delete set null
- d) All of the mentioned