

Database Management System

Referential Integrity

DPP 01

[MCQ]

1. Consider the following relation
Supervision(EmployeeID, Name,
SupervisorID) pertaining to a company's database:

EmployeeID	Name	SupervisorID
1	A	4
2	A	3
3	B	1
4	C	5
5	D	2
6	E	5
7	B	3
8	A	1

The key SupervisorID acts as a Foreign key in the relation Supervision.

The following operations are performed on the relation:

- I:** Insert a new employee having
EmployeeID==‘9’ and Name = A and
SupervisorID as ‘1’;
- II:** Set SupervisorID as ‘NULL’ where
EmployeeID==2 OR EmployeeID==4;
- III:** Set SupervisorID as ‘0’ where EmployeeID==1;

Which of the above operation(s) is/are ALLOWED?

- (a) I only (b) I and II only
(c) III only (d) I and III only

[MCQ]

2. Consider the following statements:
- P:** At most one foreign key is possible for a relational schema.
- Q:** A foreign key declaration can always be replaced by an equivalent check assertion in SQL.
- Which of the following is/are INCORRECT?
- (a) P only (b) Q only
(c) Both P and Q (d) Neither P nor Q

[MSQ]

3. Consider the relations-
- Two relations are given as R_1 (PaperCode, NumberofCandidates) and R_2 (RollNo, Papercode). Assume that each roll no must have only one papercode but one paper can be chosen by many candidates. Which of the following is/are INCORRECT?
- (a) Papercode can either act as a primary key and a foreign key in R_2 .
(b) Papercode acts as a foreign key in R_2 .
(c) Papercode satisfies UNIQUE and NOT NULL constraint R_2 .
(d) Papercode allows NULL values in R_2 .

[NAT]

4. Consider the following SQL Query:

Create table department

```
{
  a integer;
  b integer;
  primary key (a);
  foreign key (b) reference department ON
  DELETE CASCADE
};
```

The Tuples (a, b) currently in the table department are:

(0, 2) (1, 2) (2, 1) (3, 0) (5, 0) (7, 3) (4, 2) (6, 1)

Consider the following query

Delete from department where a = 0

The number of Tuples that must be additionally deleted to preserve referential integrity is _____.

[NAT]

5. Consider the following relation Supervision (EmployeeID, Name, SupervisorID) pertaining to a company's database:

<u>EmployeeID</u>	Name	SupervisorID
1	A	4
2	A	6
3	B	2
4	C	5
5	D	2
6	E	3
7	B	4
8	A	1

The key SupervisorID acts as a Foreign key in the relation Supervision. The schema follows “On Delete Cascade” constraint. The employee having EmployeeID ‘5’ is deleted from the relation Supervision. The number of tuples remaining in the relation are _____.

[NAT]

6. Consider the following relational schemas:

Catalogue		
<u>sno</u>	<u>pno</u>	cost
S1	P1	150
S1	P2	50
S1	P3	100
S2	P4	200
S2	P5	250
S3	P1	250
S3	P2	150
S3	P5	300
S3	P4	250

Suppliers		
<u>sno</u>	sname	location
S1	M/s Royal furniture	Delhi
S2	M/s Balaji furniture	Bangalore
S3	M/s Premium furniture	Chennai

Parts		
<u>pno</u>	pname	part_spec
P1	Table	Wood
P2	Chair	Wood
P3	Table	Steel
P4	Almirah	Steel
P5	Almirah	Wood

All the items supplied by M/s Balaji Furniture are banned. Moreover, the company no longer sells steel items. The schema follows “On Delete Cascade” constraint. Delete all the records from Catalogue where $sno = S2$ OR $pno = P3$ OR $pno = P4$. The number of tuples deleted from the Catalogue relation is _____.

[MCQ]

7. Consider the following statements:

P: Insertion of tuples into referenced relation may cause foreign key violation.

Q: Insertion of tuples into referencing relation may cause foreign key violation.

Which of the following is/are CORRECT?

- (a) P only (b) Q only
(c) Both P and Q (d) Neither P nor Q

[MCQ]

8. Consider the following statements:

P: Updation of tuples into referenced relation may cause foreign key violation.

Q: Updation of tuples into referencing relation may cause foreign key violation.

Which of the following is/are INCORRECT?

- (a) P only (b) Q only
(c) Both P and Q (d) Neither P nor Q

Answer Key

- | | |
|--------------|--------|
| 1. (b) | 5. (3) |
| 2. (c) | 6. (4) |
| 3. (a, c, d) | 7. (d) |
| 4. (3) | 8. (d) |



Hints & Solutions

1. (b)

Since SupervisorID act as a foreign key, the values entered in SupervisorID must be a proper subset of the values in the candidate key EmployeeID.

I: ALLOWED. SupervisorID as '1'. 1 belongs to EmployeeID.

II: ALLOWED. Foreign key allows NULL values.

III: NOT ALLOWED. SupervisorID as '0'. 0 does not belong to EmployeeID.

2. (c)

P: INCORRECT. 0 or more foreign keys are possible for a relational schema.

Q: INCORRECT. A foreign key declaration cannot be replaced by an equivalent check assertion in SQL. Check constraint checks if the value satisfies a given range or not. Foreign keys may have cascade delete which may not be satisfied by check assertion.

3. (a, c, d)

(a) INCORRECT: Papercode can act as a foreign key in R_2 .

(b) CORRECT: Papercode can act as a foreign key in R_2 .

(c) INCORRECT. Since, one paper can be chosen by many candidates, Papercode CANNOT satisfy UNIQUE constraint.

(d) INCORRECT. Each roll no can opt for only one papercode, so Papercode cannot allow NULL values in R_2 .

4. (3)

(0, 2)(1, 2)(2, 1)(3, 0)(5, 0)(7, 3)(4, 2)(6, 1)

Delete A = 0

	A	B
	0	2
	1	2
	2	1
①	3	0
②	5	0
③	7	3
	4	2
	6	1

After the Execution of Query (A = 0 Delete) with on Delete Cascade (3, 0) (5, 0) (7, 3) will be additionally deleted. So 3 Tuple additionally deleted.

5. (3)

EmployeeID	Name	SupervisorID
1	A	4
2	A	6
3	B	2
4	C	5
5	D	2
6	E	3
7	B	4
8	A	1

6. (4)

Delete all the records from Catalogue where sno = S2 OR pno = P3 OR pno = P4

7. (b)

P: INCORRECT. Referenced relation is an independent relation. Insertion of tuples into referenced relation can never cause foreign key violation.

Q: CORRECT. Insertion of tuples into referencing relation may cause foreign key violation if the entered value is not a subset of the candidate key in referenced relation.

8. (d)

P: CORRECT. Updation of tuples into referenced relation may cause foreign key violation. If the candidate key in R_1 is updated, then it must be ensured that either all its instances in R_2 is updated or deleted.

Q: CORRECT. Updation of tuples into referencing relation may cause foreign key violation if the entered value is not a subset of the candidate key in referenced relation.



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