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Authorization Quiz

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Quiz due May 10, 2022 12:52 IST

Each multiple-choice quiz problem is based on a "root question," from which the system generates different correct and incorrect choices each time you take the quiz. Thus, you can test yourself on the same material multiple times. We strongly urge you to continue testing on each topic until you complete the quiz with a perfect score at least once. Simply click the "Reset" button at the bottom of the page for a new variant of the quiz.

After submitting your selections, the system will score your quiz, and for incorrect answers will provide an "explanation" (sometimes for correct ones too). These explanations should help you get the right answer the next time around. To prevent rapid-fire guessing, the system enforces a minimum of 10 minutes between each submission of solutions.

Q1

1/1 point (graded)

[Q1] The following SQL statement over tables R(a,b), S(b,c), and T(a,c) requires certain privileges to execute:

```
UPDATE R
SET a = 10
WHERE b IN (SELECT c FROM S)
AND NOT EXISTS (SELECT a FROM T WHERE T.a = R.a)
```

Which of the following privileges is **not** useful for execution of this SQL statement?

☒ SELECT ON T(b)

☐ UPDATE ON R(a)

☐ SELECT ON R(b)

☐ SELECT ON T(a)



Problem Explanation

We need to have read access to R.a and R.b, because these attributes are referred to in "WHERE b IN..." and "WHERE T.a = R.a", respectively. Thus, we need privileges SELECT ON R(a) and SELECT ON R(b), or SELECT ON R. The subquery "(SELECT c FROM S)" requires privilege SELECT ON S(c) or SELECT ON S. The subquery "(SELECT a FROM T ...)" requires privilege SELECT ON T(a) or SELECT ON T, which also apply for condition "WHERE T.a=R.a". Finally, we need to update R.a, so either UPDATE ON R(a) or UPDATE ON R is needed. No other privileges are useful for executing the statement.

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i Answers are displayed within the problem

Q2

1/1 point (graded)

[Q2] Consider a set of users A, B, C, D, E. Suppose user A creates a table T and thus is the owner of T. Now suppose the following set of statements is executed in order:

Hide Notes

1. Now suppose the following set of statements is executed in order.

1. User A: grant update on T to B,C with grant option

2. User B: grant update on T to D with grant option

3. User C: grant update on T to D with grant option

4. User D: grant update on T to E

5. User A: revoke update on T from C cascade

After execution of statement 5, which of the following is true? After execution of statement 5, which of the following is true? After execution of statement 5, which of the following is true? After execution of statement 5, which of the following is true? After execution of statement 5, which of the following is true? After execution of statement 5, which of the following is true? After execution of statement 5, which of the following is true?

☐ C has privilege UPDATE ON T

☐ D and E do not have privilege UPDATE ON T, but B does

☐ D no longer has privilege UPDATE ON T

☒ Both D and E have privilege UPDATE ON T, but C doesn't



Problem Explanation

Let P denote the privilege "UPDATE ON T". After statements 1-4, all five users have privilege P. After statement 5, user C no longer has privilege P. Although C granted privilege P (with grant option) to user D, the "cascade" has no effect because D was also granted privilege P (with grant option) by user B.

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i Answers are displayed within the problem

Q3

1/1 point (graded)

[Q3] The following SQL statement over tables R(c,d), S(f,g), and T(a,b) requires certain privileges to execute:

```
UPDATE T
SET a=1, b=2
WHERE a <= ALL (SELECT d FROM R)
OR EXISTS (SELECT f FROM S WHERE f > T.a)
```

Which of the following privileges is **not** useful for execution of this SQL statement?

☒ SELECT ON R(c)

☐ UPDATE ON T(a)

☐ UPDATE ON T(b)

☐ SELECT ON S



Problem Explanation

We need to have read access to T.a, because it is referred to in "WHERE a <= ALL ..." and "WHERE f > T.a". Thus, we need privilege SELECT ON T(a) or SELECT ON T. The subquery "(SELECT d FROM R)" requires privilege SELECT ON R(d) or SELECT ON R. The subquery "(SELECT f FROM S WHERE f > T.a)" requires privilege SELECT ON S(f) or SELECT ON f. Finally, we need to update T.a and T.b, so either UPDATE ON T(a) and UPDATE ON T(b), or else UPDATE ON T, is needed. No other privileges are useful for executing the statement.

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i Answers are displayed within the problem

Q4

1/1 point (graded)

[Q4] Consider a set of users U, V, W, X, and Y. Suppose user U creates a table T and thus is the owner of T. Now suppose the following set of statements is executed in order:

1. User U: grant select on T to V,W with grant option
2. User V: grant select on T to W
3. User W: grant select on T to X,Y
4. User U: grant select on T to Y
5. User U: revoke select on T from V restrict
6. User U: revoke select on T from W cascade

Which of the following statements is true?

- ☒ X does not have privilege SELECT ON T after statement 6
- ☐ W has privilege SELECT ON T after statement 6
- ☐ X does not have SELECT ON T privilege after statement 5
- ☐ W does not have privilege SELECT ON T after statement 5



Problem Explanation

As owner, U has all privileges on T. Let P denote the privilege "SELECT ON T". After statement 1, V and W have privilege P granted by U. After statement 2, W is additionally granted privilege P by V. After statement 3, X and Y also have privilege P, granted by W. After statement 4, Y is additionally granted privilege P by U. After statement 5, V no longer has privilege P. The "restrict" does not block the statement since there is no cascading revoking of privileges (W still has privilege P from U). After statement 6, W loses privilege P and so does X since it was granted by W, but Y still retains privilege granted from U.

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