

CMPT 354 Final Exam - Solutions

April 17, 2021

Question 3 [2 points]

Option C

Question 5 [13 points]

$T(\underline{t}, s)$

$U(\underline{u}, v, x, y, z)$

$A(\underline{a}, b, c, t, u, r)$

$E(\underline{a}, e)$

$F(\underline{a}, f)$

$G(\underline{a}, g)$

A.t references T.t

A.u references U.u

E.a references A.a

F.a references A.a

G.a references A.a

Question 6 [3 points]

10

{AB, AC, AD, AE, BC, BD, BE, CD, CE, DE}

Or

{ABC, ABD, ABE, ACD, ECA, ADE, CDB, CEB, BDE, EDC}

Question 6 [26 points]

Question 7.A

SELECT id, name

FROM User

Where nationality = 'Canada';

Question 7.2

SELECT DISTINCT U.id, name

FROM User U, Attends A

Where U.id = A.id

Question 7.3

SELECT Event.title, Event.date, Count (Attend.id)

FROM Event

LEFT JOIN Attend ON Event.title = Attend.title AND Event.date = Attend.date

GROUP BY (Event.title, Event.date);

Question 7.4

```
SELECT DISTINCT id, name
FROM User, Friends
WHERE (id = requestor AND significantOther = requestee) OR
      (id = requestee AND significantOther = requestor)
```

Question 7.5

```
SELECT u1.id, u1.name
FROM User u1, Friends f1
WHERE u1.id = f1.requestor
GROUP BY u1.id
HAVING COUNT(*) >= ALL(
    SELECT COUNT(*)
    FROM User u2, Friends f2
    WHERE u2.nationality = u1.nationality
    AND u2.id = f2.requestor
    GROUP BY u2.id
);
```

Alternative correct answers to queries will be considered in marking.

Question 8 [3 points]

No. "A user can always issue a retrieval query against any view. However, issuing an INSERT, DELETE, or UPDATE command on a view table is in many cases not possible. In general, an update on a view defined on a single table without any aggregate functions can be mapped to an update on the underlying base table under certain conditions. For a view involving joins, an update operation may be mapped to update operations on the underlying base relations in multiple ways. Hence, it is often not possible for the DBMS to determine which of the updates is intended."

Question 9 [6 points]

```
CREATE TRIGGER DELETE_IN_CASCADE
AFTER DELETE ON EMPLOYEE
FOR EACH ROW
BEGIN
DELETE FROM DEPENDENT
WHERE ESSN = OLD.SSN;
END;
```

Question 11 [3 points]

AB+ = ABCDE

AC+ = AC

BC+ = ABCDE

ABC+ = ABCDE

Question 12 [3 points]

D, E, AB, BC

Question 13 [3 points]

Must be in 2NF, but might not be in 3NF.

Question 14 [4 points]

Option C

Question 15 [5 points]

LHS Simplification: $W \rightarrow X$, $W \rightarrow Y$, $W \rightarrow Z$, $XYZ \rightarrow W$

RHS Simplification: No change

Redundant FD deletion: No change

Minimal Cover = $W \rightarrow X$, $W \rightarrow Y$, $W \rightarrow Z$, $XYZ \rightarrow W$

Question 16 [6 points]

Candidate Keys: {ACE} , {BDE}, {ABE}, {CDE}

R1(ABD)

~~R2(BC)~~

R3(CEB)

R4(DAF)

R5(ACE) or R5(BDE) or R5(ABE) or R5(CDE)

Question 17 [4 points]

User : Read

Event: All

Attend: All

Friends: None

Question 18 [6 points]

1)

<2, 'Janet Jackson'>

<3, 'Chan Lee'>

2)

< 'Chan Lee'>, Null, 0441 221 112>

3)

<1, Null>

<2, 'Flu'>

<3, 'Healthy'>

Question 19 [1 point]

Option C