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Solutions for the midterm:

## 1. Q1.a

Only 2 and 4 should be selected.

Grading scheme:

There are 4 options

- Full marks: 4 options are correct
- 1 point: 3 options are correct
- no marks: 2 or less options are correct

## 2. Q1.b

AB and C

- Full marks: only these keys are selected
- No marks: any other answer

## 3. Q1.c

Only the 3rd should be selected.

There are 4 options:

- Full marks: 4 options are correct
- 1 point: 3 options are correct
- no marks: 2 or less options are correct

## 4. Q1.d

1,2 and 3 should be selectec

There are 4 options:

- Full marks: 4 options are correct
- 1 point: 3 options are correct
- no marks: 2 or less options are correct

## 5. Q2.a

Several ways to answer this query. Here is one:

$$CSDept = \Pi_{cid} \sigma_{department='CSC'} C$$

$$\pi_{sid} \sigma_{(cid \text{ in } CSDept) \text{ or } (age > 20)} (E \bowtie S)$$

## 6. Q2.b

$$\Pi_{sid, sname} \sigma_{sid \text{ in } \Pi_E} S$$

## 7. Q2.c

2,3 and 4 should be selected

Grading scheme:

There are 4 options

- Full marks: 4 options are correct
- 1 point: 3 options are correct
- no marks: 2 or less options are correct

## 8. Q2.d

The simplest solution:

$$\Pi_{sid} \sigma_{(grade \geq ALL(\pi_{grade} E))} S$$

It can also be done with a theta join

$$E2 = E1$$

p is a predicate, not a relation, so the query is easier to read:

$$p = (E.sid <> E2.sid) \text{ and } (E.grade < E2.grade)$$

$$NotBest = \Pi_{E.sid} (E \bowtie_p E2)$$

$$\Pi_{sid} E - NotBest$$

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[Validate](#)