

Quiz 7 Student ID: _____ Name: _____ Score (out of 9): _____

1. Let the relation $R(A, B, C, D, E)$ has functional dependency set $F=\{AB \rightarrow C, BC \rightarrow D, CD \rightarrow E\}$. E is **not** functionally dependent on which of the following?
(a) AB (b) BC (c) AC (d) CE
2. Consider the entity $Student(ID, Name, PL)$. Here PL stands for the programming languages that a student knows. If PL is a multi-valued attribute, 1NF is violated. (a) Yes (b) No

3. The IRS maintains the following table to keep track of 2016 taxes for every person:

$R(\underline{SSN}, Income, Tax, Refund)$.

In addition to \underline{SSN} being the key, we have the FDs: (1) $Income \rightarrow Tax$; and (2) $Tax \rightarrow Refund$.

(i) Does R violate 2NF? Why?

(a) Yes (b) No

(ii) Does R violate 3NF? Why?

(a) Yes (b) No

(iii) Does R violate BCNF? Why?

(a) Yes (b) No

4. Let relation $R(A, B, C, D, E, F, G)$ have FDs $\{AB \rightarrow C, CD \rightarrow E, F \rightarrow B\}$. Determine a set of the attributes that could potentially be a key.

5. Let relation $R(A, B, C, D, E)$ have FDs $\{AB \rightarrow C, AB \rightarrow D, CD \rightarrow A, CD \rightarrow B\}$. Does R violate:

(a) 2NF? Yes/No

(b) 3NF? Yes/No

(c) BCNF? Yes/No