1. We can use the following three rules to find logically implied functional dependencies. This collection of rules is called  
a) Axioms  
b) Armstrong’s axioms  
c) Armstrong  
d) Closure

Answer: b  
Explanation: By applying these rules repeatedly, we can find all of F+, given F.

2. Which of the following is not Armstrong’s Axiom?  
a) Reflexivity rule  
b) Transitivity rule  
c) Pseudotransitivity rule  
d) Augmentation rule

Answer: c  
Explanation: It is possible to use Armstrong’s axioms to prove that Pseudotransitivity rule is sound.

3. The relation employee(ID,name,street,Credit,street,city,salary) is decomposed into

employee1 (ID, name)

employee2 (name, street, city, salary)

This type of decomposition is called  
a) Lossless decomposition  
b) Lossless-join decomposition  
c) All of the mentioned  
d) None of the mentioned

Answer: d  
Explanation: Lossy-join decomposition is the decomposition used here .

4. Inst\_dept (ID, name, salary, dept name, building, budget) is decomposed into

instructor (ID, name, dept name, salary)

department (dept name, building, budget)

This comes under  
a) Lossy-join decomposition  
b) Lossy decomposition  
c) Lossless-join decomposition  
d) Both Lossy and Lossy-join decomposition

Answer: d  
Explanation: Lossy-join decomposition is the decomposition used here .

5. There are two functional dependencies with the same set of attributes on the left side of the arrow:  
A->BC  
A->B  
This can be combined as  
a) A->BC  
b) A->B  
c) B->C  
d) None of the mentioned

Answer: a  
Explanation: This can be computed as the canonical cover.

6. Consider a relation R(A,B,C,D,E) with the following functional dependencies:

ABC -> DE and

D -> AB

The number of superkeys of R is:  
a) 2  
b) 7  
c) 10  
d) 12

Answer: c  
Explanation: A superkey is a combination of columns that uniquely identifies any row within a relational database management system (RDBMS) table.

7. Suppose we wish to find the ID’s of the employees that are managed by people who are managed by the employee with ID 123. Here are two possible queries:

I.SELECT ee.empID

FROM Emps ee, Emps ff

WHERE ee.mgrID = ff.empID AND ff.mgrID = 123;

II.SELECT empID

FROM Emps

WHERE mgrID IN

(SELECT empID FROM Emps WHERE mgrID = 123);

Which, if any, of the two queries above will correctly (in SQL2) get the desired set of employee ID’s?  
a) Both I and II  
b) I only  
c) II only  
d) Neither I nor I

Answer: a  
Explanation: The query can be satisfied by any of the two options.

8. Suppose relation R(A,B) currently has tuples {(1,2), (1,3), (3,4)} and relation S(B,C) currently has {(2,5), (4,6), (7,8)}. Then the number of tuples in the result of the SQL query:

<i>SELECT \*

FROM R NATURAL OUTER JOIN S; </i>IS:

a) 2  
b) 4  
c) 6  
d) None of the mentioned

Answer: a  
Explanation: The SQL NATURAL JOIN is a type of EQUI JOIN and is structured in such a way that, columns with same name of associate tables will appear once only.

9. Suppose now that R(A,B) and S(A,B) are two relations with r and s tuples, respectively (again, not necessarily distinct). If m is the number of (not necessarily distinct) tuples in the result of the SQL query:

R intersect S;

Then which of the following is the most restrictive, correct condition on the value of m?  
a) m = min(r,s)  
b) 0 <= m <= r + s  
c) min(r,s) <= m <= max(r,s)  
d) 0 <= m <= min(r,s)

Answer: d  
Explanation: The value of m must lie between the min value of r and s and 0.

10. Suppose relation R(A,B,C,D,E) has the following functional dependencies:

A -> B

B -> C

BC -> A

A -> D

E -> A

D -> E

Which of the following is not a key?  
a) A  
b) E  
c) B, C  
d) D

Answer: c  
Explanation: Here the keys are not formed by B and C.