Normalization

Q1.

We have a database table with relational schema R(XYZPQ):

X	Y	Z	P	Q
A1	B1	C1	D1	E1
A2	B2	C1	D2	E1
A3	B2	C2	D1	E2
A4	B3	C1	D3	E3
A5	B2	C2	D4	E2

Check the validity of the functional dependencies

- ZP -> Q
- YZ -> P
- Z -> Y
- Y -> X

Q2.

For a given relational schema S = (UVWXYZ), following functional dependencies hold:

U -> V

VW -> X

Y -> W

X -> U

Find Candidate keys

Q3:

If a functional dependency set F is {A -> B, BC -> E, ED -> A, EF -> G, E -> F}, find

The closure of attribute set (AC)

a. {A, B, C, D, E, F, G}
b. {B, C, D, A, E, G}
c. {B, C, D, A, E, F}
d. {B, C, A, E, F, G}

Q4:

Consider a relation R(ABCDEFGHIJ) with the following functional dependencies:

F = {AB -> C, A -> DE, B -> F, F -> GH, D -> IJ}

a. Find all the candidate keys of relation R.

b. Which dependency/ies is/are violating the condition of 2NF?

Q5:

A relation R(ABC) is having 5 tuples: (1,2,3), (4,2,3), (5, 3,3), (2,4,4), (4,3,7). Which of the following dependencies hold over relation R?

A -> B

AB -> C

B -> C

C -> B

Q6.

For a Relation R (A, B, C, D) and F = {A -> BC, AB -> D, B -> C} be the set of functional dependencies defined over R. Which of the following represents closure of attribute set (B)?

i. {ACD}
ii. {BC}
iii. {ABC}
iv. {B}

Q7.

Relation R has eight attributes ABCDEFGH. Fields of R contain only atomic values.

F = {CH -> G, A -> BC, B -> CFH, E -> A, F -> EG} is a set of functional dependencies (FDs) so that F+ is exactly the set of FDs that hold for R.

How many candidate keys does the relation R have?

Q8.

Consider the relation scheme R = {E, F, G, H, I, J, K, L, M, N} and the set of functional dependencies

{{E, F} -> {G}, {F} -> {I, J}, {E, H} -> {K, L}, K -> {M}, L -> {N}} on R.

What is the key for R?

A. {E, F}

B. {E, F, H}

C. {E, F, H, K, L}

D. {E}

Q9.

Consider a relation R(XYZWV) with the given functional dependencies

F = {{X,Y} -> {Z,W}, {X,W,V} -> {Y,Z}}

Which of the following is the trivial functional dependency in F+?

{X,Z} -> {Z,W}

{X,V} -> {Y}

{X,W,V} -> {V,W}

{Y,W} -> {Y,X}

{X,W,V} -> {V,Y}

Q10.

Consider a relation R(XYZWV) with the given functional dependencies

F = {{X,Y} -> {Z,W}, {X,W,V} -> {Y,Z}}

Final all the trivial functional dependencies from the given functional dependencies.