Q1: BCNF is not used for cases where a relation has

1. Two (or more) candidate keys
2. Two candidate keys and composite
3. The candidate key overlap
4. Two mutually exclusive foreign keys

Q2:

What is the highest normal form of a relation R(A, B, C, D, E) with FD set?

{B → A, A → C, BC → D, AC→ BE}

Options:

1. 2NF
2. 3NF
3. BCNF
4. 4NF

Q3: Consider the following relational schemas for a library database : Book (Title, Author, Catalog_no, Publisher, Year, Price) Collection(Title, Author, Catalog_no) with the following functional dependencies :
I. Title, Author → Catalog_no
II. Catalog_no → Title, Author, Publisher, Year
III. Publisher, Title, Year → Price Assume (Author, Title) is the key for both schemas. Which one of the following is true ?

Options:

1. Both Book and Collection are in BCNF.
2. Both Book and Collection are in 3NF.
3. Book is in 2NF and Collection in 3NF.
4. Both Book and Collection are in 2NF.

Q4: Consider the schemaR = {S, T, U, V} and the dependencies
S → T, T → U, U → V and V → S If R = (R1 and R2)
 be a decomposition such that R1 ∩ R2 = φ then the decomposition is

Options:
1. not in 2NF
2. in 2NF but not in 3NF
3. in 3NF but not in 2NF

4. in both 2NF and 3NF

Q5: Relation R is decomposed using a set of functional dependencies, F, and relation S Is decomposed using another set of functional dependencies, G. One decomposition is definitely BCNF, the other is definitely 3NF, but it is not known which is which.
 To make a guaranteed identification, which one of the following tests should be used on the decompositions? (Assume that the closure of F and G are available).

Options:
1. Lossless-join
2. BCNF definition
3. 3NF definition
4. Dependency-Preservation

Q6: "The relation scheme student performance(name, courseno, rollNo, grade) has the following functional dependencies:

 Name, courseNo → grade

 rollNo, courseNo → grade

 Name → rollNo

 rollNo → name

 The highest normal form of this relation scheme is

Options:

1. 2NF

2. BCNF

3. 4NF

4. 3NF

Q6: A many-to-one relationship exists between entity sets r1 and r2. How will it be represented using functional dependencies if Pk(r) denotes the primary key attribute of relation r?

Options:

1. Pk(r1) → Pk(r2)

2. Pk(r2) → Pk(r1)

3. Pk(r2) → Pk(r1) and Pk(r1) → Pk(r2)

4. Pk(r2) → Pk(r1) or Pk(r1) → Pk(r2)

Q7: For a database relation R(a, b, c, d) where the domains of a, b, c and d include only atomic values, and only the following functional dependencies and those that can be inferred from them hold :

a → c

b → d

The relation is in

Options:

1. First normal form but not in second normal form

2. Second normal form but not in third normal form

3. Third normal form

4. BCNF

Q8: Which of the following relation schemas is definitely in BCNF?

Options:

1. R1(A,B)

2. R4(A,B,C,D,E)

3. R3(A,B,C,D)

4. R2(A,B,C)

Q9: A relation is in _____ form if every field consists only of atomic values, that is, not lists or sets.

Options:

1. First normal

2. Third normal

3. Second normal

4. Fourth normal

Q10: A table has fields Fl, F2, F3, F4, F5 with the following functional dependencies

F1 → F3,

F2→ F4,

(F1.F2) → F5

In terms of Normalization, this table is in

Options:

1. 1 NF

2. 2 NF

3. 3 NF

4. None

Q11: An instance of a relational scheme R(A, B, C) has distinct values for attribute A.

instance is a snapshot of relation at any time it doesn't mean the whole relation

Can you conclude that A is a candidate key for R?

Options:

1. Yes

2. No

Q12:

Consider a relational table R that is in 3NF, but not in BCNF. Which one of the following statements is TRUE?

Options:

1. A cell in R holds a set instead of an atomic value.

2. R has a nontrivial functional dependency X→A, where X is not a superkey and A is a non-prime attribute and X is not a proper subset of any key.

3. R has a nontrivial functional dependency X→A, where X is not a superkey and A is a non-prime attribute and X is a proper subset of some key.

4. R has a nontrivial functional dependency X→A, where X is not a superkey and A is a prime attribute.

Q13: Consider the following functional dependencies in a database:

Data_of_Birth → Age

Age → Eligibility

Name → Roll_number

Roll_number → Name

Course_number → Course_name

Course_number → Instructor

(Roll_number, Course_number) → Grade

The relation (Roll_number, Name, Date_of_birth, Age) is:

Options:

1. in second normal form but not in third normal form

2. in third normal form but not in BCNF

3. in BCNF

4. in none of the above

Q14: Consider the following relational schema:

Suppliers(sid:integer, sname:string, city:string, street:string)

Parts(pid:integer, pname:string, color:string)

Catalog(sid:integer, pid:integer, cost:real)

Assume that, in the suppliers relation above, each supplier and each street within a city has a unique name, and (sname, city) forms a candidate key. No other functional dependencies are implied other than those implied by primary and candidate keys. Which one of the following is TRUE about the above schema?

Options:

1. The schema is in BCNF

2. The schema is in 3NF but not in BCNF

3. The schema is in 2NF but not in 3NF

4. The schema is not in 2NF

Q15: Consider the following relational schemes for a library database:

Book(Title, Author, Catalog_ no, Publisher, Year, Price)

Collection (Title, Author, Catalog_no)

with in the following functional dependencies:

I. Title Author → Catalog_no

II. Catalog_no → Title Author Publisher Year

III. Publisher Title Year → Price

Assume {Author, Title} is the key for both schemes. Which of the following statements is true?

Options:

1. Both Book and Collection are in BCNF

2. Both Book and Collection are in 3NF only

3. Book is in 2NF and Collection is in 3NF

4. Both Book and Collection are in 2NF only

Q16: Consider the schema R = (S T U V) and the dependencies S → T, T → U, U → V and V → S.

Let R = (R1 and R2) be a decomposition such that R1 ∩ R2 ≠ Ø .

The decomposition is

Options:

1. not in 2NF

2. in 2NF but not 3NF

3. in 3NF but not in 2NF

4. in both 2NF and 3NF

Q17: For a database relation R(a,b,c,d), where the domains a, b, c, d include only atomic values, only the following functional dependencies and those that can be inferred from them hold:

a → c

b → d

This relation is

Options:

1. in first normal form but not in second normal form

2. in second normal form but not in third normal form

3. in third normal form

4. None of the above

Q18: Given the following two statements:

S1: Every table with two single-valued attributes is in 1NF, 2NF, 3NF and BCNF.

S2: AB->C, D->E, E->C is a minimal cover for the set of functional dependencies

AB->C, D->E, AB->E, E->C.

Which one of the following is CORRECT?

Options: 1. S1 is TRUE and S2 is FALSE.

2. Both S1 and S2 are TRUE.

3. S1 is FALSE and S2 is TRUE.

4. Both S1 and S2 are FALSE.

Q19: If a relation is an 2NF and 3NF forms, then

Options:

1. no non-prime attribute is functionally dependent on other non-prime attributes

2. no non-prime attribute is functionally depend on the prime attributes

3. all attributes are functionally independent

4. prime attribute is functionally independent of all non-prime attributes

Q20: Partial dependencies are removed to achieve which normal form?

Options:

1. First normal form

2. Second normal form

3. BCNF

4. Third normal form