Class Test

Q1. 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?

Q2. 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?. Discuss the normal form.

Q3. Consider a relational table with a single record for each registered student with the following attributes.

1. Registration_Num: Unique registration number of each registered student
2. UID: Unique identity number, unique at the national level for each citizen
3. BankAccount_Num: Unique account number at the bank. A student can have multiple accounts or join accounts. This attribute stores the primary account number.
4. Name: Name of the student
5. Hostel_Room: Room number of the hostel

Find out candidate keys and super Keys.

Q4. 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. Find out the normal form.

Q5. 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. Find our normal form.

Q6. 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.

Check these statement for corrections.

Q7. Find out the maximum number of superkeys for the relation schema R(E,F,G,H) with E.

Q8. The relation scheme Student Performance (name, courseNo, rollNo, grade) has the following functional dependencies:

name, courseNo → grade

rollNo, courseNo → grade

name → rollNo

rollNo → name

Find out the normal form.

Q9. 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

Find out normal form for this relation (Roll_number, Name, Date_of_birth, Age).