CS615

Question 1: Write the recursive definition of the following language.
L = Defining the language {a2n b4n }, n=1,2,3,… , of strings defined over ?={a, b}.

Question 2: Benefits of referential integrity constraints. State the two major

Answer:
Often, in relational database, we wish to ensure that a value that appears in one relation for a given set of attributes also appears for a certain set of attributes in another relation. This condition is called Referential integrity (RI). It is the concept of relationships between tables, based on the definition of a primary key and a foreign key.
The following summarize the benefits of referential integrity:
Ensure data integrity and consistency base on primary key and foreign key
Increases development productivity, because it is not necessary to code SQL statements to enforce referential constraints, the Teradata RDBMS automatically enforces referential integrity.

Question 3: Briefly explain super key in relation with primary key.

Answer:

Super key

A super key is a set of one or more attributes which taken collectively, allow us to identify uniquely an entity instance in the entity set. This definition is same as of a key, it means that the super key is the most general type of key. For example, consider the entity type STUDENT with attributes registration number, name, father name, address, phone, class, admission date. Now which attribute can we use that can uniquely identify any instance of STUDENT entity type. Of course, none of the name, father name, address, phone number, class, admission date can be used for this purpose. WhyBecause if we consider name as super key, and situation arises that we need to contact the parents of a particular student. Now if we say to our registration department that give us the phone number of the student whose name is Ilyas Hussain, the registration department conducts a search and comes up with 10 different Ilyas Hussain, could be anyone. So the value of the name attribute cannot be used to pick a particular instance. Same happens with other attributes. However, if we use the registration number, then it is 100% sure that with a particular value of registration number we will always find exactly a single unique entity instance. Once you identified the instance, you have all its attributes available, name, father name, everything. The entity type STUDENT and its attributes are shown graphically in the figure 1 below, with its super key "regNo" underlined.

Question 4: Briefly explain what is a primary key and give example.

Answer:

Primary Key

The candidate key that is selected to identify tuples uniquely within the relation. A candidate key chosen by the database designer to act as key is the primary key. An entity type may have more than one candidate keys, in that case the database designer has to designate one of them as primary key, since there is always only a single primary key in an entity type. If there is just one candidate key then obviously the same will be declared as primary key. The primary key can also be defined as the successful candidate key. Figure 2 below contains the entity type STUDENT of figure 1 but with an additional attribute nIdNumber (national ID card Number).

Any of the candidate keys can be selected as primary key, it mainly depends on the database designer which choice he/she makes.