Various types of databases have been developed. One of them was relational database developed by E.F Codd at IBM in 1970. It is used to organize collection of data as a collection of relations where each relation corresponds to a table of values. Each row in the table corresponds to a unique instance of data and each column name is used to interpret the meaning of that data in each row. For example, consider EMPLOYEE table in Figure 1.5(a). Each row in this table represents facts about a particular employee.

The column names – Name, Employee_ID, Gender, Salary and Date_of_Birth specify how to interpret

the data in each row.

Relational model constraints

Constraints, are restrictions on the values, stored in a database based on the requirements. For example, in the relation EMPLOYEE, the Employee_ID must be a 4-digit number, the Date_of_Birth must be such that the birth year > 1985.

We describe below various types of constraints in Relational model:

1. Domain Constraint: It specifies that the value of every attribute in each tuple must be

from the domain of that attribute. For example, the Employee_ID must be a 4-digit

number. Hence a value such as "12321" or "A234" violates the domain constraint as the

former is not 4-digit long and the latter contains an alphabet.

2. Key Constraint: Before we can explain this constraint, we need to describe the terms

superkey, key, candidate key and primary key.

(i) Superkey is a set of attributes in a relation, for which no two tuples in a relation state

have the same combination of values. Every relation must have at least one

superkey which is the combination of all attributes in a relation. Thus for the

EMPLOYEE relation, following are some of the superkeys:

(a) {Name, Employee_ID, Gender, Salary, Date_of_birth} - default superkey

consisting of all attributes.

(b) {Name, Employee_ID, Date_of_Birth}

(c) {Employee_ID, Gender, Salary}

(d) {Name, Employee_ID, Gender}

(e) {Employee_ID}