4.1 Discuss each of the following concepts in the context of the relational data model:

1. Relation

Is a table

(b) attribute  
a column in a table

(c) domain  
the data constraints in an attribute

(d) tuple  
record of data in the table

(e) intension and extension

(f ) degree and cardinality.  
Degree is the number of the attributes, cardinality is the numbers of tuples in a relation

4.4 Discuss the properties of a relation.  
The relation name must distinct from other relation names in the relational schema.

The value of each cell is atomic

Each attribute has a distinct name

Each tuple is distinct

The order of the attribute has no significance

The order of tuples has no significance

4.5 Discuss the differences between the candidate keys and the primary key of a relation. Explain what is meant by a

foreign key. How do foreign keys of relations relate to candidate keys? Give examples to illustrate your answer.

The candidate key is a superkey such that no proper subset is a superkey within the relation.

Foreign key is an attribute or set of attributes, within one relation that matches the candidate key of some (possibly the same) relation

Examples:

Company (company id, name, address)

Employee (employee id,name,company id)

Company id in Employee relation is the foreign key, but company id in Company relation is the candidate key.

4.6 Define the two principal integrity rules for the relational model. Discuss why it is desirable to enforce these rules.

1. Entity integrity: no attribute of a primary key can be null, because the primary key is the minimal identifier that is used to identity tuples uniquely.
2. Referential integrity: if the foreign key exists in a relation, either the foreign key value must math a candidate key value of some tuple in its home relation or some relation or the foreign key must be wholly null.

4.7 Define “views.” Why are they important in a database approach?

The views is a virtual relation in the database.

Provide a powerful and flexible mechanism by hiding part of the database from certain user.

It can simplify the complex operation on the base relation.