Database Concepts

Short Answer Type Questions-I

Question 1:
What is relation? Define the relational data model.

Answer:
A relation is a table having atomic values, unique row and unordered rows and columns. The relational mode represent data and relationship among data by a collection of tables known as relation, each of which has a number of columns with unique names.

Question 2:
What are all the domain names possible in gender ?

Answer:
Male and Female.

Question 3:
Give a suitable example of a table with sample data and illustrate Primary and Candidate Keys in it.

Answer:
A table may have more than one such attribute/ group of attribute that identifies a row/tuple uniquely, all such attribute(s) are known as Candidate Keys. Out of the Candidate keys, one is selected as Primary Key,

Question 4:
Differentiate between cardinality and degree of a table with the help of an example.

Answer:
Cardinality is defined as the number of rows in table.
Degree is the number of columns in a table,
eg: Consider the following tables

Table : Account

Acno	Cname
Ac 100	Sheela
Ac 101	Darsh
Ac 102	Kathy

Table of Qs. 3 : Stock

Candidates Keys		Qty
Primary Keys		
101	Pen	560
102	Pencil	780
104	CD	450
109	Floopy	700
105	Eraser	300
103	Duster	200

(1 Mark for writing suitable example/correct definition of a table)
(½ Mark for correct illustration/definition of Candidate Keys)
(½ Mark for correct illustration/definition of Primary Key)
Cardinality of Account table is : 3
Degree of Account table is : 2
[½ mark each for definition of cardinality and degree]
[1 mark for correct demonstration using example]

Question 5:
Observe the following table carefully and write the names of the most appropriate columns, which can be considered as (i) candidate keys and (ii) primary key.

Id	Product	Qty	Price	Transaction Date
101	Plastic Folder 12"	100	3400	2014-12-14
104	Pen Stand Standard	200	4500	2015-01-31
105	Stapler Medium	250	1200	2015-02-28
109	Punching Machine Big	200	1400	2015-03-12
103	Stapler Mini	100	1500	2015-02-02

Answer:

Candidate keys : Id, Product
Primary keys: Id
(1 Mark for writing correct Candidate keys)
(1 Mark for writing correct Primary key)

Note : No marks to be deducted for mentioning Price and/or Transaction Date as additional candidate keys.

Question 6:
Observe the following table carefully and write the names of the most appropriate columns, which can be considered as (i) candidate keys and (ii) primary key :

Code	Item	Qty	Price	Transaction Date
1001	Plastic Folder 14"	100	3400	2014-12-14
1004	Pen Stand Standard	200	4500	2015-01-31
1005	Stapler Mini	250	1200	2015-02-28
1009	Punching Machine Small	200	1400	2015-03-12
1003	Stapler Big	100	1500	2015-02-02

Answer:
Candidate keys : Code, Item Primary keys : Code
(1 Mark for writing correct Candidate keys)
(1 Mark for writing correct Primary key)
Note : No marks to be deducted for mentioning Price and/or Transaction Date as additional candidate keys.

Question 7:
Define degree and cardinality. Based upon given table write degree and cardinality.

Patients

PatNo	PatName	Dept	DocID
1	Leena	ENT	100
2	Supreeth	Ortho	200
3	Madhu	ENT	100
4	Neha	ENT	100
5	Deepak	Ortho	200

Answer:
Degree is the number of attributes or columns present in a table.
Cardinality is the number of tuples or rows present in a table.
Patients Degree = 4
[½ mark for each correct definition]

Cardinality = 5
[½ mark for each correct answer]

Question 8:
Differentiate between the Primary key and Alternate key of a table with the help of an example.

Answer:
Primary Key – A primary key is a value that can be used to identify a unique row in a table .
Alternate Key – An alternate key is any candidate key which is not selected to be the primary key.
Example:

Consider table PERSON

Name	Bank Account Number	Aadhaar Number
Sunderajan	1290889909	1800991222
Gopal	1909090909	1908909090
Bhavish	1902090909	8298291282

So, (Bank Account Number, Aadhaar Number) is a candidate key for the table.
Aadhaar Number ” Primary key
Bank Account Number ” Alternate Key

Question 9:
Explain the concept of candidate keys with the help of an appropriate example.

Answer:
Candidate key is a column or set of columns that can help in identifying records uniquely.

Example,consider a Table STUDENT

AdmnNo	Roll No.	Name	Class	Marks
2715	1	Ram	12	90
2716	2	Ajay	11	98
2811	3	Jayesh	12	98
2914	4	Tarun	11	94

Here, AdminN0 & Roll N0 define Table uniquely.
Hence, they are candidate keys.

Question 10:
A table 'customer' has 10 columns but no row. Later, 10 new rows are inserted and 3 rows are deleted in the table. What is the degree and cardinality of the table customer

Answer:
Degree = 10[no.of cols]
Cardinality = 10-3=7[no.of rows]

Question 11:
A table 'student' has 3 columns and 10 rows and another table 'student 2' has the same number of columns and 15 rows. 5 rows are common in both the tables. If we take union, what is the degree and cardinality of the resultant table ?

Answer:
Degree-3
Cardinality – 30 = (20 + 15-5)

Question 12:
A table 'studentl' has 4 columns and 10 rows and table 'student 2' has 5 columns and 5 rows.If we take cartesian product of these two tables,what is the degree and cardinally of the resultant table?

Answer:

Degree-4 ×5=20[no.of columns]
Cardinally – 10×5 = 50 [no.of rows]

Question 13:
Observe the following table and answer the parts (i) and (ii) :

Table : Store

Item Code	Item	Qty	Rate
10	Gel Pen Classic	1150	25
11	Sharpener	1500	10
12	Ball Pen 0.5	1600	12
13	Eraser	1600	5
15	Ball Pen 0.25	800	20

1. In the above table, can we have Qty as primary key.[Answer as yes/no]. Justify your answer.
2. What is the cardinality and degree of the above table ?

Answer:

1. We cannot use Qty as primary key because there is dulication of values and primary key value cannot be duplicate.
2. Degree = 4

[1/2 mark for each correct definition]
Cardinity = 5
[1/2 mark for each correct definition]

Question 14:
What do you understand by Union & Cartesian product in the relational algebra ?

Answer:

Union of R and S : The Union of two relations is a relation that includes all the tuples that are either in R or in S or in both R and S. Duplicate tuples are eliminated.
Cartesian Product: The Cartesian Product is an operator which works on two sets. It combines the tuples of one relation with all the tuples of the other relation.
Example: Cartesian Product

Table A

A#	A_name
A001	Richa
A002	Priya
A003	Ashish

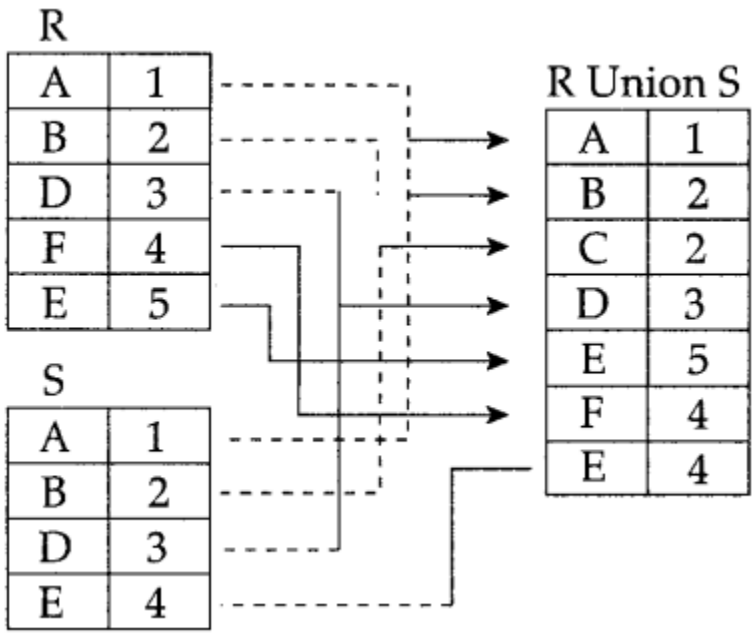
Table B

B#	Item	Cost
B1	Pencil	4
B2	Eraser	2

A × B

A#	A_Name	B#	Item	Cost
A001	Richa	B1	Pencil	4
A001	Richa	B2	Eraser	2
A002	Priya	B1	Pencil	4
A002	Priya	B2	Eraser	2
A003	Priya	B1	Pencil	4
A003	Priya	B2	Eraser	2

The Union is an operator which works on two sets. It combines the tuples of one relation with all the tuples of the other relation such that there is no duplication.



Question 15:
Explain the concept of union between two tables, with the help of appropriate example.

Answer:
The union operation denoted by 'U' combines two or more relations. The resultant of union operation contain tuples that are in either of the table or in both tables.
For example :

A =

Name	Total Marks
Yash	40
Jay	50

B =

Name	Total Marks
Jay	50
Varun	30

then, AUB =

Name	Total Marks
Yash	40
Jay	50
Varun	30

Question 16:

In the following 2 tables, find the union value of Student 1 and Student 2.

Student 1

Roll No.	Name
11	Kumar
22	Mohan
33	Rohit

Student 2

Roll No.	Name
22	Mohan
11	Rahul
77	Kavita

Answer:

The resultant table is

Roll No.	Name
11	Kumar
22	Mohan
33	Rohit
11	Rahul
77	Kavita

Question 17:
Observe the table 'Club' given below :

Club : z

Member_ id	Member_ Name	Address	Age	Fee
M001	Sumit	New Delhi	20	2000
M002	Nisha	Gurgaon	19	3500
M003	Niharika	New Delhi	21	2100
M004	Sachin	Faridabad	18	3500

1. What is the cardinality and degree of the above given table ?
2. If a new column contact_no has been added and three more members have joined the club then how these chages will affect the degree and cardinality of the above given table.

Answer:

Cadinality: 4
Degree: 5
(1/2 Mark for each correct answer)
2. Cadinality: 7
Degree: 6
(1/2 Mark for each correct answer)

Question 18:
In which situation can we apply union operation of two table ?

Answer:
Each table in the UNION

1. should have the same number of columns
2. similar data types
3. columns must be in the same order [2]

Short Answer Type Questions – II

Question 1:
Observe the following STUDENTS and EVENTS tables carefully and write the name of

the RDBMS operation which will be used to produce the output as shown in LIST. Also, find the Degree and Cardinality of the LIST.

STUDENTS

No.	NAME
1	TARA Mani
2	Jaya Sarkar
3	Tarini Trikha

EVENTS

EVENTCODE	EVENTNAME
1001	Programming
1002	IT Quiz

LIST

No	NAME	EVENTCODE	EVENTNAME
1	Tara Mani	1001	Programming
1	Tara Mani	1002	IT Quiz
2	Jaya Sarkar	1001	Programming
2	Jaya Sarkar	1002	IT Quiz
3	Tarini Trikha	1001	Programming
3	Tarini Trikha	1002	IT Quiz

Answer:

Cartesian Product
Degree = 4
Cardinality = 6

Question 2:

Observe the following PARTICIPANTS and EVENTS tables carefully and write the name of the RDBMS operation which will be used to produce the output as shown in RESULT. Also, find the Degree and Cardinality of the

PARTICIPANTS

No.	NAME
1	Aruanabha Tariban
2	John Fedricks
3	Kanti Desai

EVENTS

EVENTCODE	EVENTNAME
1001	IT Quiz
1002	Group Debate

RESULT

No.	NAME	EVENTCODE	EVENTNAME
1	Anuanabha Tariban	1001	IT Quiz
1	Aruanabha Tariban	1002	Group Debate
2	John Fedricks	1001	IT Quiz
2	John Fedricks	1002	Group Debate
3	Kanti Desai	1001	IT Quiz
3	Kanti Desai	1002	Group Debate

Answer:

Degree = no of columns = 4
Cartesian Product
Cardinality = no. of rows = 6