Database Concepts

Short Answer Type Questions-I

Question 1:
Observe the following PARTICIPANTS and EVENTS table cerefully 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 RESULT.

PARTICIPANTS	
NO.	Name
1	Aruanabha Tariban
2	John Fedricks
3	Kanti Desai

EVENTS	
EVENTCODE	EVENTNAME
1001	IT Quiz
1002	Group Debate

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

Answer:
Cartesian Product
Degree — 4
Cardinality = 6

Question 2:
Define degree and cardinality. Also, 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
Cardinality = 5

Question 3:
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.
2. What is the cardinality and degree of the above table?

Answer:

1. We cannot use Qty as primary key because there is a duplication of values and primary key value cannot be duplicate.
2. Degree =4
   Cardinality = 5

Question 4:
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.

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 5:
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 table? Also, find the degree and cardinality of the table.

STUDENTS

NO.	Name
1	Tara Mani
2	Jaya Sarkar IST
3	Tarini Trikha

EVENTS

EVENTCODE	EVENTNAME
1001	Programming
1002	IT Quiz

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 6:
Observe the following MEMBER and ACTIVITY tables carefully and write the name of the RDBMS operation, which will be used to produce the output as shown in REPORT?

Also, find the Degree and Cardinality of the REPORT.

MEMBER	
MNO	NAME
101	Jahan Dogra
202	Yog Sen
301	Ahmed Saad

ACTIVITY	
CODE	ANAME
1	SWIMMING
2	FOOTBALL

MNO	NAME	CODE	ANAME
101	Jahan Dogra	1	SWIMMING
101	Jahan Dogra	2	FOOTBALL
202	Yog Sen	1	SWIMMING
202	Yog Sen	2	FOOTBALL
301	Ahmed Saad	1	SWIMMING
301	Ahmed Saad	2	FOOTBALL

Answer:
Join operation or MEMBER U ACTIVITY
Degree of Report = No of columns
(No of Attributes) = 3
Candinality Report = No of Rows
(No of tuples) = 6

Question 7:
Observe the table 'Club' given below:

CLUB				
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 given table?
2. If a new column Contact_No has been added and three more members have joined the club then

Answer:

1. Cardinality = 4 Degree = 5
2. Cardinality = 7
3. Degree = 6

Question 8:
What do you understand by Union & Cartesian product in the relational algebra?

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

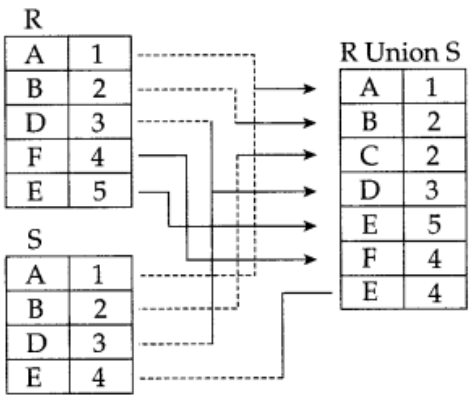
Cartesian Product: The cartesian product is an operator which works on two sets. It combines the tuples of one relation with all the tuples of the other relation.

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



Question 9:
Differentiate between the 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) are candidate keys for the table.
Aadhaar Number — Primary key
Bank Account Number — Alternate key

Question 10:
Explain the concept of candidate key 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, AdmnNo & Roll No define Table uniquely.
Hence, they are candiadate keys

Question 11:
What do you understand by degree & cardinality of a Table ?

Answer:
Degree refers to the number of columns in a table.
Cardinality refers to the number of rows.

Question 12:
Observe the following table and answer the part (i) and (ii) accordingly.

Table: Member

Mno	Name	Qty	Purchase Date
101	Pen	102	12-12-2011
102	Pencil	201	21-02-2012
102	Eraser	90	09-08-2010
109	Sharpener	90	31-08-2012
113	Clips	900	08-08-2011

1. In the above table, can we take Mno as Primary key ? (Answer as [Yes/No] only.) Justify your answer with a valid reason.
2. What is the degree and the cardinality of the above table?

Answer:

1. No
2. Degree = 4
   Cardinality = 5
   [**Hint:** Because Pencil and Eraser are having the same Mno = 2. Primary key needs to be unique]

Question 13:
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 or a 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.

Table : Stock

Id	Item	Qty
101	Pen	560
102	Pencil	780
104	CD	450
109	Floopy	700
105	Eraser	300
103	Duster	200

Id = Primary key Id and Qty = Candidates Keys

Question 14:
What do you understand by selection and projection operations in the relational algebra?

Answer:
Projection (n): In relational algebra, projection is a unary operation. The result of such projection is defined as the set obtained when the components of the tuple R are restricted to the set $\{a_1 \ldots, a_n\}$ – it discards (or exculdes) the other attributes.
Selection (σ): In relational algebra, a selection is a unary operation written as r_{aib} (R) or v_{aiv}(R) where:

1. a and b are attribute names
2. i is a binary operation in the set
3. v is a value constant
4. R is a relation

The selection v_{σ}(R) selects all those tuples in R for which i holds between the a atribute and the b attribute.

Example: Selection and Projection

Table: Student

Stud_id	Stu_Name	Stu_Age
S1	Ashish	15
S2	Arun	16
S3	Ajay	16
S4	Ashima	13

vStu_Age = "16" (Student)

Stud_id	Stu_Name	Stu_Age
S2	Arun	16
S3	Ajay	16

rStud_id, Stu_Name (Student)

Stud_id	Stu_Name
S1	Ashish
S2	Arun
S3	Ajay
S4	Ashish

Question 15:
What do you understand by Primary key and Candidate keys.

Answer:
An attribute or set of attributes which are used to identify a tuple uniquely is known as primary key. If a tuple has more than one such attribute which identify a tuple uniquely, than all such attributes are known as candidate keys.

Question 16:
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 model 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 17:
Define domain with respect to database. Give an example.

Answer:
A domain is a pool of values from which the actual values appearing in a given column are drawn.
For example: The values appearing in the Supp# column of both the suppliers table and

the Shipment table are drawn from the same domain.

Shipment

Supp#	Item#	Qty
S1	12	10
S1	13	20
S2	14	30
S2	15	40
S3	16	50
S4	17	60

Supplier

Supp#	Status	City
S1	Haldiram	Delhi
S2	Parle	Jaipur
S3	Bakers	Banglore

Question 18:
Expand the following:

1. SQL
2. DBMS

Answer:

1. SQL – Structured Query Language.
2. DBMS – Data Base Management System.

Question 19:
What do you understand by candidate keys in a table? Give a suitable example of candidate keys from a table containing some meaningful data.

Answer:
Candidate key: A candidate key is one that can identify each row of a table uniquely. Generally, a candidate key becomes the primary key of the table. If the table has more than one candidate key, one of them will become the primary key, and the rest are called alternate keys.
Example:

Student

Roll No	Reg#	Name	Father Name	Address
12340	AECMCA07	Rabab Fatima	M. S. Naqvi	Akbari gate chowk Lucknow
12341	AECMCA08	Shavez Naqvi	M. S. Naqvi	Akbari gate chowk Lucknow
12342	AECMCA09	Arzo Naqvi	Rizwan Naqvi	23/9 Vikas Nagar Lucknow
12343	AECMCA10	Yasir	Faiz	34/8 Lakheempur
12344	AECMCA11	Ali Raza	Mehdi Raza	Bima Hospital Barabanki
12345	AECMCA12	Choto	Mehdi Raza	Bima Hospital Barabanki
12346	AECMCA13	Ata haider	Shuja Haider	Unchahar Raibareli

Question 20:
What are all the domain names possible in gender?

Answer:
Male and Female

Question 21:
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 22:
A table 'student' has 3 columns and 10 rows and another table 'student 2' has the same columns as student but 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 23:
A table 'student' has 4 columns and 10 rows and 'student 2' has 5 columns and 5 rows. If we take cartesian product of these two tables, what is the degree and cardinality of the resultant table ?

Answer:
Degree = 4 x 5 = 20 [no. of columns]
Cardinality = 10 x 5 = 50 [no. of rows]

Question 24:
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:

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