

- 1) Describe the concept of Centralized vs. Client/server Model. 7M
- 2) Discuss Schema and Instance. 3M
- 3) Explain the advantages of DBMS. 5M
- 4) Discuss about different types of Keys. 5M
- 5) Explain Generalization and Specialization in DBMS using ER diagrams. 5M
- 6) Explain in detail about the strong entity set and weak entity set in ER diagrams. 5M
- 7) Draw and explain the detailed system architecture of DBMS. 5M
- 8) Explain about Database Applications. 5M
- 9) What are the different data models? Explain its types in detail. 5M
- 10) Discuss Components of ER-Model. Write about Relationship types in ER Model. 8M
- 11) Consider a relation CityDetails(CityName, Population, CountryName) where the superkeys are as follows: {CityName}, {CityName, Population}, {CityName, CountryName}, {CityName, Population, CountryName}.
Select the possible candidate key(s).
a) {CityName, Population, CountryName}
b) {CityName, Population}
c) {CityName}
d) {CityName, CountryName} 2M
- 12) Discuss in detail about different types of database users. 5M
- 13) Explain about data independence. 5M
- 14) Classify DDL and DML Commands in SQL with Example for each. 5M
- 15) Explain in detail about Relational Calculus. 5M
- 16) Explain various Join operations in Relational Algebra. 5M
- 17) Explain in detail about the strong entity set and weak entity set in ER diagrams 5M
- 18) Explain Set Operations in Relational Algebra. 5M
- 19) Explain constraints (Domain ,Key constraints, integrity constraints) and their importance. 5M
- 20) Illustrate Integrity Constraints (NOT NULL, UNIQUE, PRIMARY KEY, FOREIGN KEY, DEFAULT, CHECK) over relations with examples. 10M
- 21) Compare the differences between DBMS and FILE System. 8M
- 22) What are the standard operations available in relational algebra? Explain with suitable examples? 10M
- 23) Classify DDL, DML commands in SQL with example for each. 7M
- 24) Discuss Data Types in SQL. 5M
- 25) Discuss the concepts of domain, attribute, tuple, relation, NULL values and constraints 5M

26) Illustrate Three-tier Schema Architecture for Data Independence. How are these different schema layers related to the concepts of logical and physical data independence? 10M

27) Discuss in detail about importance of NULL values. 3M

28) Create a table Employee (eno, ename, dno)

1) insert 5 rows into the table and

use alter, update, delete commands on the above table. 7M

29) Explain about Domain key constraints, Integrity key constraints and Referential constraints with suitable examples. 8M

30)

Consider the following table for a ride-sharing application:

DriverDetails	
DriverID	Location
D001	Bangalore
D002	Hyderabad
D003	Chennai
D004	Pune
D005	Bhopal
D006	Delhi

2M

What is the output of the following SQL query:

```
SELECT Location FROM DriverDetails WHERE Location LIKE 'B%' AND Location LIKE '%e' ;
```

31)

Consider the following tables:

CityDetails ₁		
CityName	Population	StateName
Mumbai	20000	Maharashtra
Delhi	19000	Delhi
Ahmedabad	8000	Gujarat
Pune	6000	Maharashtra

3M

CityDetails ₂		
CityName	Population	StateName
Mumbai	20000	Maharashtra
Bengaluru	12000	Karnataka
Ahmedabad	8000	Gujarat
Chennai	10000	Tamil Nadu

What is the resultant table for the Relational Algebra:

$CityDetails_1 \cap CityDetails_2$

32)

Consider the following instance of the DriverDetails(DriverID, Name, Age, City) relation.

DriverDetails			
DriverID	Name	Age	City
D001	John	25	New York
D002	Sarah	32	Los Angeles
D003	Michael	30	Chicago
D004	Alice	28	New York
D005	David	35	Los Angeles
D006	Emma	40	Chicago
D007	Olivia	22	New York
D008	James	28	Los Angeles

3M

What will be the output of the following query?

```
SELECT DriverID, Name, City
FROM DriverDetails d1
WHERE Age > (
    SELECT AVG(Age)
    FROM DriverDetails d2
    WHERE d1.City = d2.City
);
```

33) How do you write a query in tuple relational calculus? 2M

34)

Identify the valid **primary key** for the relation `event_registration` from the given instance.

2M

event_registration			
participant_id	event_id	registration_date	status
1001	E001	2024-01-10	Confirmed
1002	E002	2024-01-11	Pending
1003	E001	2024-01-10	Confirmed
1001	E003	2024-01-12	Confirmed
1004	E002	2024-01-14	Pending

35)

Consider the following table:

2M

CityDetails		
CityName	Population	StateName
Mumbai	20000	Maharashtra
Delhi	19000	Delhi
Bengaluru	12000	Karnataka
Hyderabad	10000	Telangana
Ahmedabad	8000	Gujarat
Pune	6000	Maharashtra

What is the output of the following Relational Algebra:

$\sigma(\text{Population} \geq 12000) \vee (\text{StateName} = \text{'Delhi'}) (\text{CityDetails})$

36) Write the importance of Logical data independence. 2M

37) Comment on “Entity verses Relationship”. 2M

38) List out the Various types of Joins. 2M

39) Differentiate between Procedural Query Language and Declarative Query Language.

2M

40) Define Schema and Instance. 2M

41) What are integrity constraints? Define the terms primary key constraint and foreign key constraint 2M

42) Define Domain, Tuple and Relation. 2M

43) Write about on Entity and Entity-Set 2M

44) What are different Data Base Languages? What are the different SQL constructs(keywords) used in these Languages? 2M

45) Write about inheritance, super class and sub class. 2M

46) Compare UNIQUE and NOT NULL Constraints. 2M