



Maratha Vidya Prasarak Samaj's

Rajarshi Shahu Maharaj Polytechnic, Nashik

Udoji Maratha Boarding Campus, Near Pumping Station, Gangapur Road, Nashik-13.

RSM POLY

Affiliated to MSBTE Mumbai, Approved by AICTE New Delhi, DTE Mumbai & Govt. of Maharashtra, Mumbai.

Subject: - Principles of Database
(22321)



SYLLABUS

Chapter No.	Name of chapter	Marks With Option
1	Basics Of Database And Architecture	18
2	Data Models And Database Types	14
3	Database Design Using ER Diagrams	22
4	Relational Database Model	30
5	Normalization	20
6		
7		
8		
9		
10		
Total Marks: -		104



BOARD THEORY

PAPER PATTERN

FOR POD (22321)

Q.1		Attempt any FIVE	5*2=10
	A.	Relational database model	
	B.	Basics of database and architecture	
	C.	Data models and database types	
	D.	Relational database model	
	e)	Basics of database and architecture	
	f)	Basics of database and architecture	
	g)	Normalization	
Q.2		Attempt any THREE	3*4=12
	A.	Relational database model	
	B.	Data models and database types	
	C.	Database design using er diagrams	
	D.	Basics of database and architecture	



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Q.3		Attempt any THREE	3*4=12
	A.	Relational database model	
	B.	Normalization	
	C.	Database design using er diagrams	
	D.	Data models and database types	
Q.4		Attempt any THREE	3*4=12
	A.	Normalization	
	B.	Data models and database types	
	C.	Basics of database and architecture	
	D.	Data models and database types	
	e)	Relational database model	
Q.5		Attempt any TWO	2*6=12
	A.	Normalization	
	B.	Database design using er diagrams	
	C.	Normalization	
Q.6		Attempt any TWO	2*6=12
	A.	Relational database model	
	B.	Database design using er diagrams	
	C.	Relational database model	



CLASS TEST - I

PAPER PATTERN

COURSE: - Principles of Database (22321)

PROGRAMME: - Information Technology

Syllabus: -

Unit No.	Name of the Unit	Course Outcome (CO)
1	Basics Of Database And Architecture	CO-321.01
2	Data Models And Database Types	CO-321.02
3	Database Design Using ER Diagrams	CO-321.03

Q.1	Attempt any FOUR 4*2=8Marks	Course Outcome (CO)
A.	Basics Of Database And Architecture	CO-321.01
B.	Data Models And Database Types	CO-321.02
C.	Database Design Using ER Diagrams	CO-321.03
D.	Basics Of Database And Architecture	CO-321.01
e)	Data Models And Database Types	CO-321.02
f)	Database Design Using ER Diagrams	CO-321.03
Q.2	Attempt any THREE 3*4=12 Marks	
A.	Basics Of Database And Architecture	CO-321.01
B.	Data Models And Database Types	CO-321.02
C.	Database Design Using ER Diagrams	CO-321.03



CLASS TEST - II

PAPER PATTERN

COURSE: - Principles of Database (22321)

PROGRAMME: - Information Technology

Syllabus: -

Unit No.	Name of the Unit	Course Outcome (CO)
4	Relational Database Model	CO-321.04
5	Normalization	CO-321.05

Q.1	Attempt any FOUR 4*2=8Marks	Course Outcome (CO)
A.	Relational Database Model	CO-321.04
B.	Normalization	CO-321.05
C.	Relational Database Model	CO-321.04
D.	Normalization	CO-321.05
e)	Relational Database Model	CO-321.04
f)	Normalization	CO-321.05
Q.2	Attempt any THREE 3*4=12 Marks	
A.	Relational Database Model	CO-321.04
B.	Normalization	CO-321.05
C.	Relational Database Model	CO-321.04



COURSE OUTCOME

(CO)

COURSE: - Principles of Database (22321)

PROGRAMME: - Information Technology

CO. NO.	Course Outcome
CO-321.01	Use fundamental concepts of database in Database Systems
CO-321.02	Choose relevant data model to solve problems
CO-321.03	Develop relational database using Entity Relationship modeling approach
CO-321.04	Apply constraints for data integrity in relational database
CO-321.05	Apply data normalization and de-normalization techniques on database



1. Basics of Database and Architecture

Position in Question Paper

Total Marks-18

Q.1. B. 2-Marks.

Q.1. e) 2-Marks.

Q.1. f) 2-Marks

Q.2. D. 4-Marks.

Q.2. B. 4-Marks.

Q.4. C. 4-Marks.

Descriptive Question

Q.1. List any four DBMS software.

Q.2. Define Database. List any two advantages of database system.

Q.3. Define data abstraction. Explain the levels of data abstraction with neat diagram.

Q.4. Compare file system and database system.

Q.5. Explain different operations performed with Data Definition Language

Q.6. List 4 types of Database languages

Q.7. Enlist components of database.

Q.8. State any four characteristics of Database

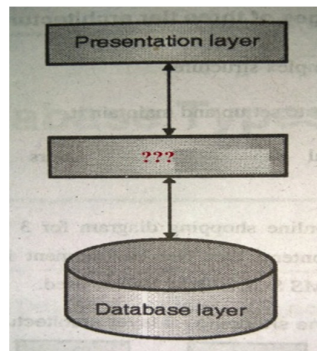
Q.9. Distinguish between file processing system and DBMS

MCQ Question

(Total number of Question=Marks*3=12*3=36)

Note: Correct answer is marked with **bold**.

- Describe Composite attribute.
 - are made of more than one simple attribute.**
 - the attributes that do not exist in the physical database, but their values are derived from other attributes present in the database.
 - attributes contain single value.
 - None of the given options
- Identify which of the following is NOT a Database Language.
 - Data Definition Language
 - Data Manipulation Language
 - Data Control Language
 - Date Creation Language**
- Select the right option at "???"



- Business Layer
 - Data Layer
 - Actual Layer
 - Logical Layer**
- State "CREATE" table is command of ____ .
 - Data Definition Language**
 - Data Creation Language
 - Data Manipulation Language
 - Data Control Language
 - Select which is/are the type(s) of Data Independence from given option.
 - Physical Data Independence
 - logical Data Independence
 - Both Physical and Logical**
 - None of the given options
 - Select the option from the following where the given statement is defined "Extracting the important data by ignoring the remaining irrelevant details".
 - Data Abstraction**
 - Data Independence
 - Data integrity
 - Data Extraction
 -



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7. Select database application/(s) from the following.
- A. Telecom
 - B. Railway Reservation System
 - C. Banking
 - D. All the given options**
8. A relational database consists of a collection of
- A. Tables**
 - B. Fields
 - C. Records
 - D. Keys
9. A _____ in a table represents a relationship among a set of values.
- A. Column
 - B. Key
 - C. Row**
 - D. Entry
10. The term _____ is used to refer to a row.
- A. Attribute
 - B. Tuple**
 - C. Field
 - D. Instance
11. The term attribute refers to a _____ of a table.
- A. Record
 - B. Column**
 - C. Tuple
 - D. Key
12. For each attribute of a relation, there is a set of permitted values, called the _____ of that attribute.
- A. Domain**
 - B. Relation
 - C. Set
 - D. Schema
13. Database _____ which is the logical design of the database, and the database _____ which is a snapshot of the data in the database at a given instant in time.
- A. Instance, Schema
 - B. Relation, Schema
 - C. Relation, Domain
 - D. Schema, Instance**
14. Course(course_id,sec_id,semester)
Here the course_id,sec_id and semester are _____ and course is a _____
- A. Relations, Attribute
 - B. Attributes, Relation**
 - C. Tuple, Relation
 - D. Tuple, Attributes
15. A domain is atomic if elements of the domain are considered to be _____ units.
- A. Different
 - B. Indivisible**
 - C. Constant
 - D. Divisible
16. The tuples of the relations can be of _____ order.
- A. Any**
 - B. Same
 - C. Sorted
 - D. Constant



17. Which one of the following is a set of one or more attributes taken collectively to uniquely identify a record?

- A. Candidate key
- B. Sub key
- C. **Super key**
- D. Foreign key

18. The subset of a super key is a candidate key under what condition?

- A. **No proper subset is a super key**
- B. All subsets are super keys
- C. Subset is a super key
- D. Each subset is a super key

19. A _____ is a property of the entire relation, rather than of the individual tuples in which each tuple is unique.

- A. Rows
- B. **Key**
- C. Attribute
- D. Fields

20. Which one of the following attribute can be taken as a primary key?

- A. Name
- B. Street
- C. **Id**
- D. Department

21. Which one of the following cannot be taken as a primary key?

- A. Id
- B. Register number
- C. Dept_id
- D. **Street**

22. An attribute in a relation is a foreign key if the _____ key from one relation is used as an attribute in that relation.

- A. Candidate
- B. **Primary**
- C. Super
- D. Sub

23. Using which language can a user request information from a database?

- A. **Query**
- B. Relational
- C. Structural
- D. Compiler

24. The result which operation contains all pairs of tuples from the two relations, regardless of whether their attribute values match.

- A. Join
- B. **Cartesian product**
- C. Intersection
- D. Set difference

25. The _____ operation performs a set union of two “similarly structured” tables

- A. **Union**
- B. Join
- C. Product
- D. Intersect



26. The most commonly used operation in relational algebra for projecting a set of tuple from a relation is
- A. Join
B. Projection
C. **Select**
D. Union
27. The _____ operator takes the results of two queries and returns only rows that appear in both result sets.
- A. Union
B. **Intersect**
C. Difference
D. Projection
28. A _____ is a pictorial depiction of the schema of a database that shows the relations in the database, their attributes, and primary keys and foreign keys.
- A. **Schema diagram**
B. Relational algebra
C. Database diagram
D. Schema flow
29. The _____ provides a set of operations that take one or more relations as input and return a relation as an output.
- A. Schematic representation
B. **Relational algebra**
C. Scheme diagram
D. Relation flow
30. The basic data type char(n) is a _____ length character string and varchar(n) is _____ length character.
- A. Fixed, equal
B. Equal, variable
C. **Fixed, variable**
D. Variable, equal
31. An _____ is a set of entities of the same type that share the same properties, or attributes.
- A. **Entity set**
B. Attribute set
C. Relation set
D. Entity model
32. Entity is a _____
- A. Object of relation
B. Present working model
C. **Thing in real world**
D. Model of relation
33. The level of data abstraction which describes how the data is actually stored is :
- A conceptual level
B **physical level**
C file level
D none of these
34. Collection of information stored in a database at a particular moment is :
- A view
B schema
C **instance**
D none of the above



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35. The data model which describes how the data is actually stored is :
- A **internal model**
 - B external model
 - C logical model
 - D none of these
36. Data about data is normally termed as :
- A directory
 - B data bank
 - C **meta data**
 - D none of the above



2. Data Models and Database Types

Position in Question Paper

Total Marks-18

Q.1. C. 2-Marks.

Q.2. B. 4-Marks.

Q.3. D. 4-Marks

Q.4. B. 4-Marks.

Q.4. D. 4-Marks.

Descriptive Question

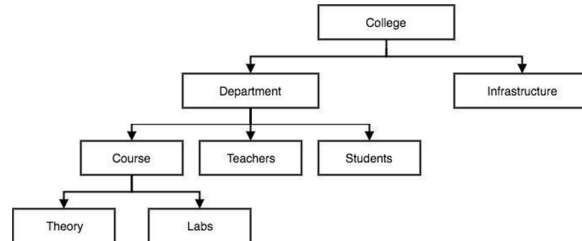
- Q.1. Define Domain and Attribute.
- Q.2. Define database model.
- Q.3. Distinguish between network database model and relational database model
- Q.4. Define Domain and Attribute
- Q.5. Define Constraint
- Q.6. Explain different types of attributes
- Q.7. Explain client/server database system
- Q.8. Explain entity integrity constraint with example
- Q.9. Describe centralized database system with example
- Q.10. Define the term Data Model
- Q.11. Describe object oriented data models
- Q.12. Compare Hierarchical Database Model with Network Model

MCQ Question

(Total number of Question=Marks*3=12*3=36)

Note: Correct answer is marked with **bold**

1. Identify the Model of given image.



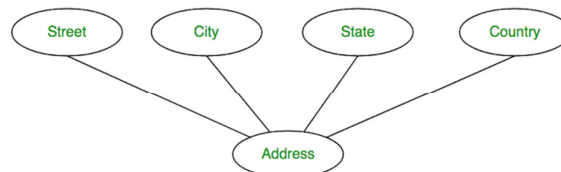
A. **Hierarchical Model**

C. Object Oriented Model

B. Network Model

D. Relational Model

2. Identify the type of attribute in the figure given below.



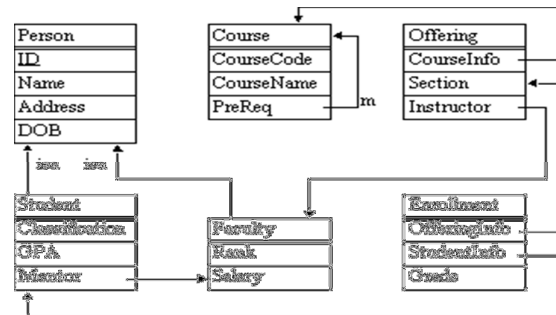
A. **Composite attribute**

C. Derived attribute

B. Multi-valued attribute

D. Big attribute

3. State the model shown in the given diagram.



A. Entity-relationship Model

C. Relational Model

B. **Object Oriented Model**

D. Network Model

4. Define the term "Tuple".

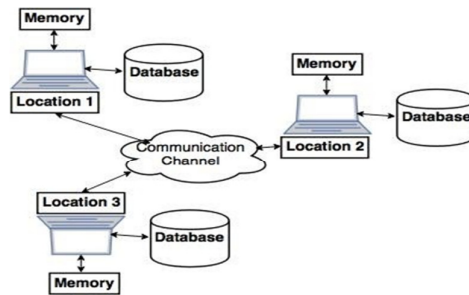
A. unique set of values permitted for an attribute in a table.

B. **Each row in the relation**

C. is a two-dimensional table

D. are the properties which define a relation

5. State the correct option for the model shown in figure below.



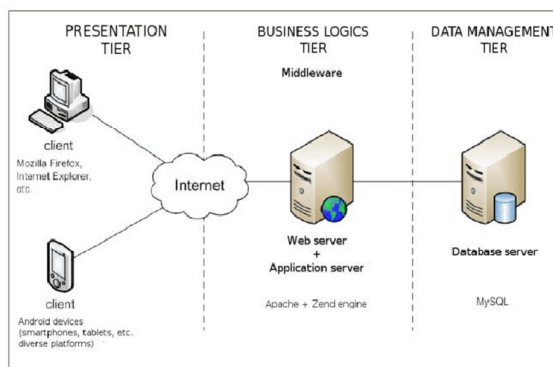
A. Distributed Database Model

B. Centralize Database Model

C. Client Sever Model

D. None of the option is correct.

6. Describe the figure given below.



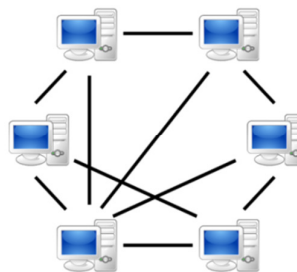
A. 3-tier client server architecture

B. 2-tier client server architecture

C. 3-tier parallel database architecture

D. 3-tier Distributed database architecture

7. Explain the figure given below.



A. Peer-to-peer database Architecture

B. Parallel database Architecture

C. Distributed database Architecture

D. Client Server database Architecture



8. The scheme for hierarchical database is :
- A a tree
 - B a graph
 - C a B-tree
 - D none of the above
9. Which one is an example for network database ?
- A Unify
 - B Ingress
 - C IDMS
 - D None of the above
10. One of the following is a valid record-based data model :
- A Object-oriented model
 - B **Relational model**
 - C Entity-relationship model
 - D None of the above
11. In an object-oriented model, one object can access data of another object by passing :
- A Instance variable
 - B **Message**
 - C Variable
 - D None of these
12. SET concept is used in :
- A **Network model**
 - B Hierarchical model
 - C Relational model
 - D None of the above
13. A view of database that appears to an application program is known as :
- A schema
 - B **subschema**
 - C virtual table
 - D none of the above
14. Choose the DBMS, which supports full-fledged client server application development ?
- A dBASEIV
 - B **Oracle 7.1**
 - C FoxPro 2.1
 - D Ingress
15. A top-to-bottom relationship among the items in a database is established by a :
- A **Hierarchical schema**
 - B Network schema
 - C Relational schema
 - D All of the above
16. A data model is :
- A Used to describe structure of a database
 - B Set of basic operations on the database
 - C **Both [A] and [B]**
 - D None of the above
17. In a hierarchical database, a hashing function is used to locate the :
- A **Root**
 - B Collisions
 - C Primary key
 - D Duplicate records
18. Between the users and the database itself, a DBMS will act as :
- A barrier
 - B **interface**
 - C referee
 - D obstacle
19. Which one of the following is not an object-based logical model ?
- A The binary model
 - B The entity-relational model
 - C **The infological model**
 - D None of these
20. Which one of the following design is both software and hardware independent ?
- A Logical
 - B Physical



-
- C Conceptual** **D None of the above**
21. Object based data models are used in describing the abstraction of the following level :
A Only physical C Physical and conceptual
B **Conceptual and view** D None of the above
22. Manager's salary details are hidden from the employee. This is :
A **Conceptual level data hiding** C External level data hiding
B Physical level data hiding D None of these
23. Which one is lowest level data model ?
A **physical data model** C external data model
B logical data model D none of the above
24. Data items grouped together for storage purposes are called a :
A **record** C list
B title D string
25. A report generator is used to :
A update files C data entry
B **print files on paper** D all of the above
26. Data are :
A **Raw facts and figures** C Electronic representation of facts
B Information D None of the above
27. Data processing cycle consists of :
A Input cycle and output cycle
B **Input cycle, output cycle and processing cycle**
C Output cycle and processing cycle
D None of the above
28. Top level manager uses :
A Internal information only C Both [A] and [B]
B **External information only** D None of these
29. A large computer information system maintains many different computer files. Which amongst them is called a perpetual file ?
A Specialized file C **Master file**
B Log file D Update file
30. A set of objects that share a common structure and a common behavior is called :
A Object C Entity
B **Class** D None of these
31. The database environment has all of the following components except :
A users C database
B **separate files** D database administrator
32. The key to a cost-effective data input operation is :
A OCR equipment B validity checks



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- C validation
33. Complex entities can be constructed using the following operation :
- A SUM
B Union
34. The logical data structure with a one-to-many relationship is a :
- A network
B **tree**
35. Which of the following is not an element of Database ?
- A Schema objects
B Indexes
36. The highest level in the hierarchy of data organization is called :
- A data bank
B **database**
- D **employee motivation**
- C **Aggregation**
D Collection
- C chain
D relationship
- C Tables
D **Database Administrator**
- C data file
D data record



3. Database Design Using ER Diagrams

Position in Question Paper

Total Marks-22

Q.2. C. 4-Marks.

Q.3. C. 4-Marks

Q.5. B. 6-Marks.

Q.6. B. 6-Marks.

Descriptive Question

- Q.1. Describe enhanced ER model with the help of example
- Q.2. Explain terms primary key and candidate key with example
- Q.3. Draw ER diagram of library management system in which library maintain the data of books, borrowers, issue return details, fine collection, supplier of books etc. Assume suitable data and display the relationship among entities.
- Q.4. List and draw any four symbols used in ER-Model
- Q.5. Draw and name 4 symbols used in ER diagram
- Q.6. Construct an E-R diagram for a car insurance company whose customers own one or more cars. Assume suitable attributes.
- Q.7. Explain various types of Relational constraints
- Q.8. For each of following relationship indicate type of relationship (1 : 1, 1 : m, m : m)
- a) Works in (a relationship between entities dept. and staff)
 - b) Managers (a relationship between entities employee and Manager)

MCQ Question

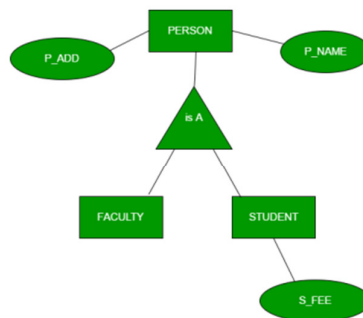
(Total number of Question=Marks*3=14*3=42)

Note: Correct answer is marked with **bold**

1. Describe what the given symbol represents.

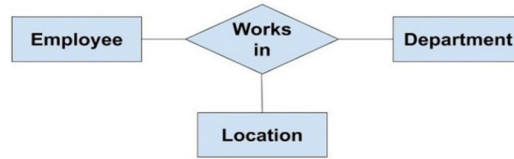


- | | |
|-------------------------|----------------|
| A. Strong Entity | C. Relation |
| B. Attribute | D. Weak Entity |
2. Select which among the following is NOT type of cardinality.
- | | |
|-----------|---------------------|
| A. 1:1 | C. many:many |
| B. 1:many | D. none:many |
3. State Foreign Key belong to which Integrity constraint type.
- | | |
|--|--------------------------------|
| A. Referential Integrity Constraint | C. Entity Integrity Constraint |
| B. Domain Integrity Constraint | D. Enterprise Constraint |
4. Describe NOT NULL constraint.
- | | |
|--|-------------------------------|
| A. Null Values are not allowed. | C. Null values are allowed |
| B. Only Unique Values are allowed | D. Default values are allowed |
5. State Primary Key belong to which Integrity constraint type.
- | | |
|-------------------------------------|---------------------------------------|
| A. Referential Integrity Constraint | C. Entity Integrity Constraint |
| B. Domain Integrity Constraint | D. Enterprise Constraint |
6. Explain figure shown below.



- | | |
|--------------------------|----------------|
| A. Generalization | C. Aggregation |
| B. Specialization | D. Realization |

7. State the degree of the relationship.



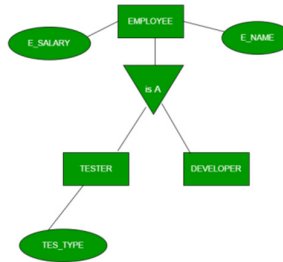
A. Ternary Relationship

B. Binary Relationship

C. Quaternary Relationship

D. Unary Relationship

8. Explain figure shown below.



A. Specialization

B. Aggregation

C. Generalization

D. Realization

9. Identify which among the following is NOT a type of Entity.

A. Strong Entity

B. Weak Entity

C. Real Entity

D. None of the option are correct

10. The number of attributes in relation is called as its

A. Cardinality

B. Degree

C. Tuples

D. Entity

11. Which one of the following is a set of one or more attributes taken collectively to uniquely identify a record?

A. Candidate key

B. Sub key

C. Super key

D. Foreign key

12. The subset of a super key is a candidate key under what condition?

A. No proper subset is a super key

B. All subsets are super keys

C. Subset is a super key

D. Each subset is a super key

13. A _____ is a property of the entire relation, rather than of the individual tuples in which each tuple is unique.

A. Rows

B. Key

C. Attribute

D. Fields



14. Which one of the following attribute can be taken as a primary key?
A. Name
B. Street
C. **Id**
D. Department
15. Which one of the following cannot be taken as a primary key?
A. Id
B. Register number
C. Dept_id
D. **Street**
16. An attribute in a relation is a foreign key if the _____ key from one relation is used as an attribute in that relation.
A. Candidate
B. **Primary**
C. Super
D. Sub
17. Consider attributes ID, CITY and NAME. Which one of this can be considered as a super key?
A. NAME
B. **ID**
C. CITY
D. CITY, ID
18. The relation with the attribute which is the primary key is referenced in another relation. The relation which has the attribute as a primary key is called _____
A. Referential relation
B. Referencing relation
C. **Referenced relation**
D. Referred relation
19. The _____ is the one in which the primary key of one relation is used as a normal attribute in another relation.
A. Referential relation
B. Referencing relation
C. **Referenced relation**
D. Referred relation
20. A _____ integrity constraint requires that the values appearing in specified attributes of any tuple in the referencing relation also appear in specified attributes of at least one tuple in the referenced relation.
A. **Referential**
B. Referencing
C. Specific
D. Primary
21. Using which language can a user request information from a database?
A. **Query**
B. Relational
C. Structural
D. Compiler
22. Which one of the following is a procedural language?
A. Domain relational calculus
B. Tuple relational calculus
C. **Relational algebra**
D. Query language
23. The _____ operation allows the combining of two relations by merging pairs of tuples, one from each relation, into a single tuple.
A. Select
B. **Join**
C. Union
D. Intersection



24. The _____ operation performs a set union of two “similarly structured” tables
- A. **Union**
B. Join
C. Product
D. Intersect
25. Which of following are the properties of entities ?
- A Groups
B Table
C **Attributes**
D Switchboards
26. Between the users and the database itself, a DBMS will act as :
- A barrier
B **interface**
C referee
D obstacle
27. Which of these is not a database object ?
- A index
B sequence
C **cursor**
D trigger
28. A schema describes :
- A Record Relationship
B Data Elements
C Record and files
D **All of the above**
29. An abstraction concept for building composite object from their component object is called :
- A Specialization
B Normalization
C Generalization
D **Aggregation**
30. A computer file contains several records. What does each record contain ?
- A Bytes
B Words
C **Fields**
D Database
31. Which of the following types of information is used by the top level managers ?
- A Operational information
B Technical information
C Both [A] and [B]
D **Strategic information**
32. A set of objects that share a common structure and a common behavior is called :
- A Object
B **Class**
C Entity
D None of these
33. An association between students and courses is :
- A 1:1 relationship
B 1:M relationship
C **M:M relationship**
D None of these
35. A schema describes :
- A data elements
B records and files
C records relationship
D **all of the above**
36. The following may be regarded as a metadata :
- A E-R diagram
B Table
C **Data dictionary**
D View of a database



37. A hierarchical data model is :
- A Partially ordered
 - B Not ordered
 - C **Totally ordered**
 - D Concept of ordering does not appear
38. The set of all possible values of data items is called :
- A **Domain**
 - B Attribute
 - C Tuples
 - D None of these
39. Every weak entity set can be converted into a strong entity set by :
- A using generalization
 - B **adding appropriate attributes**
 - C using aggregation
 - D none of the above
40. A weak entity set in an E-R diagram is an entity set that :
- A has a primary key
 - B **must be part of a one to many relationship set**
 - C is not existence dependent on a dominant entity
 - D must not participate as owner in an identifying relationship with another entity set
41. E-R model uses which symbol to represent weak entity set :
- A Dotted rectangle
 - B Diamond
 - C **Doubly outlined rectangle**
 - D None of the above
42. In an E-R, Y is the dominant entity and X is a subordinate entity. Then which of the following is incorrect ?
- A operationally, If Y is deleted, so is X
 - B **X existence is dependent on Y**
 - C operationally, if X is deleted, so is Y
 - D operationally, if X is deleted, Y remains the same



4. Relational Database Model

Position in Question Paper

Total Marks-30

Q.1. A. 2-Marks.

Q.1. D. 4-Marks.

Q.2. A. 4-Marks.

Q.3. A. 4-Marks.

Q.4. e) 4-Marks

Q.6. A. 6-Marks.

Q.6. C. 6-Marks.

Descriptive Question

Q.1. Explain any four Codd's rules. Explain any four Codd's rules.

Q.2. Consider the following schemas :

a) Dept (Dept_no, Dept_name, Dept-loC.

b) Staff (Staff_id, Staff_name, Dept_no, Joint_date)

Draw and explain parent-child relationship for above schemas and find out foreign key with justification.

Q.3. Define the term Database Schema

Q.4. Define the term Foreign key.

Q.5. Explain Integrity constraints with example



MCQ Question

(Total number of Question=Marks*3=18*3=54)

Note: Correct answer is marked with **bold**

1. State Relational model is concerned of.
A. Data structure and Data integrity
B. Data Manipulation
C. **Both A and B**
D. None of these
2. Describe NOT NULL constraint
A. **Null Values are not allowed.**
B. Only Unique Values are allowed
C. Null values are allowed
D. Default values are allowed
3. State "CREATE" table command of belongs to____ .
A. **Data Definition Language**
B. Data Creation Language
C. Data Manipulation Language
D. Data Control Language
4. Write the syntax for RENAME table command. [CO-321.4] *
A. CREATE TABLE table_name (column_name column_type);
B. ALTER TABLE table_name ADD new_column_name column_definition [FIRST | AFTER column_name];
C. **RENAME old_table TO new_table; 3**
D. INSERT INTO table_name (field1, field2,...fieldN) VALUES (value1, value2,...valueN);
5. State Foreign Key belong to which Integrity constraint type. [CO-321.4] *
A. **Referential Integrity Constraint**
B. Domain Integrity Constraint
C. Entity Integrity Constraint
D. Enterprise Constraint
6. The relational model is based on the concept that data is organized and stored in two-dimensional tables called
A. Fields
B. Records
C. **Relations**
D. Keys
7. Write the syntax for ALTER table command.
A. CREATE TABLE table_name (column_name column_type);
B. **ALTER TABLE table_name ADD new_column_name column_definition [FIRST | AFTER column_name];**
C. RENAME old_table TO new_table; 3
D. INSERT INTO table_name (field1, field2,...fieldN) VALUES (value1, value2,...valueN);



8. Interpret the statement " NULL values must be given uniform treatment" belongs to which Codd's Rule.
- A. **Systematic treatment of NULL values rule**
 - B. Information Representation rule
 - C. Guaranteed access rule
 - D. View updating rule
9. Write the syntax for CREATE table command. [CO-321.4] *
- A. **CREATE TABLE table_name (column_name column_type);**
 - B. ALTER TABLE table_name ADD new_column_name column_definition [FIRST | AFTER column_name];
 - C. RENAME old_table TO new_table; 3
 - D. INSERT INTO table_name (field1, field2,...fieldN) VALUES (value1, value2,...valueN);
10. Define Guaranteed access rule [CO-321.4] *
- A. **Every single data element must be accessible.**
 - B. Information must be stored in forms of tables.
 - C. NULL values must be given uniform treatment
 - D. None of the given options
11. A tuple is
- A. Column of a table.
 - B. Two dimensional table.
 - C. **Row of a table.**
 - D. Key of a table
12. Write the syntax for INSERT command.
- A. CREATE TABLE table_name (column_name column_type);
 - B. ALTER TABLE table_name ADD new_column_name column_definition [FIRST | AFTER column_name];
 - C. RENAME old_table TO new_table; 3
 - D. **INSERT INTO table_name (field1, field2,...fieldN) VALUES (value1, value2,...valueN);**
13. Identify the constraint for checking the value in column.
- A. **Check**
 - B. Not Null
 - C. Unique
 - D. None of the given options
14. Which one of the following is used to define the structure of the relation, deleting relations and relating schemas?
- A. DML(Data Manipulation Language)
 - B. **DDL(Data Definition Language)**
 - C. Query
 - D. Relational Schema
15. Which one of the following provides the ability to query information from the database and to insert tuples into, delete tuples from, and modify tuples in the database?



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-
- A. **DML(Data Manipulation Language)**
B. DDL(Data Definition Language)
16. What type of statement is this?
A. DML
B. **DDL**
C. Query
D. Relational Schema
17. `SELECT * FROM employee`
What type of statement is this?
A. **DML**
B. DDL
C. View
D. Integrity constraint
18. An attribute A of datatype varchar(20) has the value "Avi". The attribute B of datatype char(20) has value "Reed". Here attribute A has ____ spaces and attribute B has ____ spaces.
A. **3, 20**
B. 20, 4
C. 20, 20
D. 3, 4
19. To remove a relation from an SQL database, we use the _____ command.
A. Delete
B. Purge
C. Remove
D. **Drop table**
20. `DELETE FROM r; //r - relation`
This command performs which of the following action?
A. Remove relation
B. **Clear relation entries**
C. Delete fields
D. Delete rows
21. `INSERT INTO instructor VALUES (10211, 'Smith', 'Biology', 66000);`
What type of statement is this?
A. Query
B. **DML**
C. Relational
D. DDL
22. Updates that violate _____ are disallowed.
A. **Integrity constraints**
B. Transaction control
C. Authorization
D. DDL constraints
23. Here which of the following displays the unique values of the column?
`SELECT _____ dept_name
FROM instructor;`
A. All
B. From
C. **Distinct**
D. Name
24. The _____ clause allows us to select only those rows in the result relation of the _____ clause that satisfy a specified predicate.
A. **Where, from**
B. From, select
C. Select, from
D. From, where



25. This Query can be replaced by which one of the following?

```
SELECT name, course_id  
FROM instructor, teaches  
WHERE instructor_ID= teaches_ID;
```

- A. Select name, course_id from teaches, instructor where instructor_id=course_id;
- B. Select name, course_id from instructor natural join teaches;**
- C. Select name, course_id from instructor;
- D. Select course_id from instructor join teaches;

26. In the given query which of the keyword has to be inserted?

```
INSERT INTO employee _____ (1002, Joey, 2000);
```

- A. Table
- B. Values**
- C. Relation
- D. Field

27. `SELECT * FROM employee WHERE salary>10000 AND dept_id=101;`

Which of the following fields are displayed as output?

- A. Salary, dept_id
- B. Employee
- C. Salary
- D. All the field of employee relation**

28. The _____ clause is used to list the attributes desired in the result of a query.

- A. Where
- B. Select**
- C. From
- D. Distinct

```
29. SELECT name _____ instructor name, course id  
FROM instructor, teaches  
WHERE instructor.ID= teaches.ID;
```

Which keyword must be used here to rename the field name?

- A. From
- B. Rename
- C. As**
- D. Join

30. `SELECT * FROM employee WHERE dept_name="Comp Sci";`

In the SQL given above there is an error . Identify the error.

- A. Dept_name
- B. Employee
- C. "Comp Sci"**
- D. From

```
31. SELECT emp_name  
FROM department  
WHERE dept_name LIKE ' _____ Computer Science';
```

Which one of the following has to be added into the blank to select the dept_name which has Computer Science as its ending string?

- A. %
- B. _
- C. ||
- D. \$



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32. '___' matches any string of _____ three characters. '___%' matches any string of at _____ three characters.

- A. Atleast, Exactly
- B. **Exactly, Atleast**
- C. Atleast, All
- D. All, Exactly

33. SELECT name
FROM instructor
WHERE dept name = 'Physics'
ORDER BY name;

By default, the order by clause lists items in _____ order.

- A. Descending
- B. Any
- C. Same
- D. **Ascending**

34. SELECT *
FROM instructor
ORDER BY salary _____, name _____;

To display the salary from greater to smaller and name in ascending order which of the following options should be used?

- A. Ascending, Descending
- B. Asc, Desc
- C. **Desc, Asc**
- D. Descending, Ascending

35. SELECT instructor.*
FROM instructor, teaches
WHERE instructor.ID= teaches.ID;

This query does which of the following operation?

- A. All attributes of instructor and teaches are selected
- B. **All attributes of instructor are selected on the given condition**
- C. All attributes of teaches are selected on given condition
- D. Only the some attributes from instructed and teaches are selected

36. In SQL the spaces at the end of the string are removed by _____ function.

- A. Upper
- B. String
- C. **Trim**
- D. Lower

37. _____ operator is used for appending two strings.

- A. &
- B. %
- C. ||
- D. _

38. The union operation is represented by

- A. \cap
- B. **U**
- C. -
- D. *



39. The intersection operator is used to get the _____ tuples.
- A. Different
B. **Common**
C. All
D. Repeating
40. The union operation automatically _____ unlike the select clause.
- A. Adds tuples
B. Eliminates unique tuples
C. Adds common tuples
D. **Eliminates duplicate**
41. If we want to retain all duplicates, we must write _____ in place of union.
- A. **Union all**
B. Union some
C. Intersect all
D. Intersect some
42. (SELECT course id
FROM SECTION
WHERE semester = 'Fall' AND YEAR= 2009)
EXCEPT
(SELECT course id
FROM SECTION
WHERE semester = 'Spring' AND YEAR= 2010);
This query displays
- A. Only tuples from second part
B. Only tuples from the first part which has the tuples from second part
C. Tuples from both the parts
D. **Tuples from first part which do not have second part**
43. The number of attributes in relation is called as its
- A. Cardinality
B. **Degree**
C. Tuples
D. Entity
44. _____ clause is an additional filter that is applied to the result.
- A. Select
B. Group-by
C. **Having**
D. Order by
45. _____ joins are SQL server default
- A. Outer
B. **Inner**
C. Equi
D. None of the mentioned
46. A _____ indicates an absent value that may exist but be unknown or that may not exist at all.
- A. Empty tuple
B. New value
C. **Null value**
D. Old value
47. If the attribute phone number is included in the relation all the values need not be entered into the phone number column. This type of entry is given as
- A. 0
B. -
C. **Null**
D. Empty space



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48. In an employee table to include the attributes whose value always have some value which of the following constraint must be used?
- A. Null
B. **Not null**
C. Unique
D. Distinct
49. Using the _____ clause retains only one copy of such identical tuples.
- A. Null
B. Unique
C. Not null
D. **Distinct**
50. CREATE TABLE employee (id INTEGER, name VARCHAR(20), salary NOT NULL);
INSERT INTO employee VALUES (1005, Rach, 0);
INSERT INTO employee VALUES (1007, Ross,);
INSERT INTO employee VALUES (1002, Joey, 335);
Some of these insert statements will produce an error. Identify the statement.
- A. Insert into employee values (1005,Rach,0);
B. Insert into employee values (1002,Joey,335);
C. **Insert into employee values (1007,Ross,);**
D. None of the mentioned
51. SELECT _____
FROM instructor
WHERE dept name= 'Comp. Sci.';
Which of the following should be used to find the mean of the salary ?
- A. Mean(salary)
B. **Avg(salary)**
C. Sum(salary)
D. Count(salary)
52. SELECT COUNT (____ ID.
FROM teaches
WHERE semester = 'Spring' AND YEAR = 2010;
If we do want to eliminate duplicates, we use the keyword _____ in the aggregate expression.
- A. **Distinct**
B. Count
C. Avg
D. Primary key
53. All aggregate functions except _____ ignore null values in their input collection.
- A. Count(attribute)
B. **Count(*)**
C. Avg
D. Sum
54. The phrase “greater than at least one” is represented in SQL by _____
- A. < all
B. < some
C. > all
D. **> some**



5. Normalization

Position in Question Paper

Total Marks-20

Q.3. B. 4-Marks.

Q.4. A. 4-Marks.

Q.5. A. 6-Marks.

Q.5. C. 6-Marks.

Descriptive Question

Q.1. Consider the relation R with five attributes L, M, N, O, P You are given following dependencies:

$L \rightarrow M, MN \rightarrow P, PO \rightarrow L$

a) List all keys for R.

b) Is R in 3 NF?

Justify your answer.

Q.2. Consider a single table consisting following columns. Convert it into 2NF and 3NF
Table : (supplier_no, supplier_name, supplier_city, order_no, order_quantity, order_amount, product_code, product_name)

Q.3. Explain BCNF with example.

Q.4. Describe functional dependency with example

Q.5. List advantages of Normalization

Q.6. Explain benefits and drawbacks of Denormalization

Q.7. Describe the first normal form with its example

Q.8. Consider 'student' database with appropriate details. Write a procedure to manipulate given database by adding, modifying and deleting records.



MCQ Question

(Total number of Question=Marks*3=14*3=42)

Note: Correct answer is marked with **bold**

1. Describe FD

- A. **Functional dependency**
- B. Facilitate dependency
- C. Functional data
- D. Facilitate data

2. In 2NF....

- A. No functional dependencies (FDs) exist
- B. No multivalued dependencies (MVDs) exist
- C. **No partial FDs exist**
- D. No partial MVDs exist

3. Describe the correct option on basis of the statement "If a relation is in BCNF, then it is also in"

- A. 1 NF
- B. 2 NF
- C. 3 NF
- D. **All of the above**

4. List which is (are) the types of functional dependency (ies).

- A. Transitive Dependency
- B. Partial Dependency
- C. Trivial Dependency
- D. **All options are correct**

5. Determine the normalization for the given example A table has fields F1, F2 , F3 , F4, F5 with the following functional dependencies $F_1 \rightarrow F_3, F_2 \rightarrow F_4, (F_1, F_2) \rightarrow F_5$

- A. **1 NF**
- B. 2 NF
- C. 3 NF
- D. None of these

6. 14. If attribute A and B determines both attribute B and C, then it also true that

- A. **$A \rightarrow B$.**
- B. $B \rightarrow A$.
- C. $C \rightarrow A$.
- D. $(B, C) \rightarrow A$.

7. A functional dependency of the form $x \rightarrow y$ is trivial interpret the correct option.

- A. **$y \subseteq x$**
- B. $y \subset x$
- C. $x \subset y$
- D. $x \subset y$ and $y \subset x$

8. List which among the following is (are) types of anomaly (ies)

- A. Insert anomaly
- B. Update anomaly
- C. Delete anomaly
- D. **All option are correct**

9. If A and B determine attribute C Then it is also true that:

- A. $A \rightarrow C$.
- B. $B \rightarrow C$.
- C. **(A,B) is a composite determinant.**
- D. C is a determinant



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10. In a schema with attributes A, B, C, D and E following set of functional dependencies are given $A \twoheadrightarrow BA \twoheadrightarrow CCD \twoheadrightarrow EB \twoheadrightarrow DE \twoheadrightarrow A$ Determine functional dependencies is the implied by the above set.
- A. $CD \twoheadrightarrow AC$
 - B. $BD \twoheadrightarrow CD$
 - C. $BC \twoheadrightarrow CD$
 - D. $AC \twoheadrightarrow BC$
11. The database design prevents some data from being stored due to _____.
- A. Deletion anomalies
 - B. **Insertion anomalies**
 - C. Update anomalies
 - D. Selection anomalies
12. Describe the normalization form: If every non-key attribute is functionally dependent primary key,
- A. First normal form
 - B. **Second normal form**
 - C. Third form
 - D. Fourth normal form
13. In the _____ normal form, a composite attribute is converted to individual attributes.
- A. **First**
 - B. Second
 - C. Third
 - D. Fourth
14. A table on the many side of a one to many or many to many relationship must:
- A. Be in Second Normal Form (2NF)
 - B. Be in Third Normal Form (3NF)
 - C. Have a single attribute key
 - D. **Have a composite key**
15. Tables in second normal form (2NF):
- A. **Eliminate all hidden dependencies**
 - B. Eliminate the possibility of a insertion anomalies
 - C. Have a composite key
 - D. Have all non key fields depend on the whole primary key
16. Which-one ofthe following statements about normal forms is FALSE?
- A. BCNF is stricter than 3 NF
 - B. Lossless, dependency -preserving decomposition into 3 NF is always possible
 - C. **Loss less, dependency – preserving decomposition into BCNF is always possible**
 - D. Any relation with two attributes is BCNF
17. Functional Dependencies are the types of constraints that are based on_____
- A. **Key**
 - B. Key revisited
 - C. Superset key
 - D. None of the mentioned



18. Which is a bottom-up approach to database design that design by examining the relationship between attributes:
- A. Functional dependency
 - B. Database modeling
 - C. **Normalization**
 - D. Decomposition
19. Which forms simplifies and ensures that there are minimal data aggregates and repetitive groups:
- A. 1NF
 - B. 2NF
 - C. **3NF**
 - D. All of the mentioned
20. Which forms has a relation that possesses data about an individual entity:
- A. 2NF
 - B. 3NF
 - C. **4NF**
 - D. 5NF
21. Which forms are based on the concept of functional dependency:
- A. 1NF
 - B. 2NF
 - C. **3NF**
 - D. 4NF
22. Empdt1(empcode, name, street, city, state, pincode).
For any pincode, there is only one city and state. Also, for given street, city and state, there is just one pincode. In normalization terms, empdt1 is a relation in
- A. 1 NF only
 - B. **2 NF and hence also in 1 NF**
 - C. 3NF and hence also in 2NF and 1NF
 - D. BCNF and hence also in 3NF, 2NF and 1NF
23. We can use the following three rules to find logically implied functional dependencies.
This collection of rules is called
- A. Axioms
 - B. **Armstrong's axioms**
 - C. Armstrong
 - D. Closure
24. Which of the following is not Armstrong's Axiom?
- A. Reflexivity rule
 - B. Transitivity rule
 - C. **Pseudotransitivity rule**
 - D. Augmentation rule
25. The relation employee(ID,name,street,Credit,street,city,salary) is decomposed into
employee1 (ID, name)
employee2 (name, street, city, salary)
This type of decomposition is called
- A. Lossless decomposition
 - B. Lossless-join decomposition
 - C. All of the mentioned
 - D. **None of the mentioned**
26. Inst_dept (ID, name, salary, dept name, building, budget) is decomposed into
instructor (ID, name, dept name, salary)
department (dept name, building, budget)
This comes under
- A. Lossy-join decomposition



- B. Lossy decomposition
C. Lossless-join decomposition
D. **Both Lossy and Lossy-join decomposition**
27. There are two functional dependencies with the same set of attributes on the left side of the arrow:
A \rightarrow BC
A \rightarrow B
This can be combined as
A. **A \rightarrow BC** C. B \rightarrow C
B. A \rightarrow B D. None of the mentioned
28. Consider a relation R(A,B,C,D,E) with the following functional dependencies:
ABC \rightarrow DE and
D \rightarrow AB
The number of superkeys of R is:
A. 2 C. **10**
B. 7 D. 12
29. Suppose we wish to find the ID's of the employees that are managed by people who are managed by the employee with ID 123. Here are two possible queries:
I. SELECT ee.empID
FROM Emps ee, Emps ff
WHERE ee.mgrID = ff.empID AND ff.mgrID = 123;
II. SELECT empID
FROM Emps
WHERE mgrID IN
(SELECT empID FROM Emps WHERE mgrID = 123);
Which, if any, of the two queries above will correctly (in SQL2) get the desired set of employee ID's?
A. **Both I and II** C. II only
B. I only D. Neither I nor I
30. Suppose relation R(A,B) currently has tuples {(1,2), (1,3), (3,4)} and relation S(B,C) currently has {(2,5), (4,6), (7,8)}. Then the number of tuples in the result of the SQL query:
<i>SELECT *FROM R NATURAL OUTER JOIN S; </i> IS:
A. **2** C. 6
B. 4 D. None of the mentioned
31. Suppose relation R(A,B,C,D,E) has the following functional dependencies:
A \rightarrow B BC \rightarrow A E \rightarrow A
B \rightarrow C A \rightarrow D D \rightarrow E
Which of the following is not a key?
A. A C. **B, C**
B. E D. D



32. A relation is in _____ if an attribute of a composite key is dependent on an attribute of other composite key.
- | | |
|--------|---------|
| A. 2NF | C. BCNF |
| B. 3NF | D. 1NF |
33. What are the desirable properties of a decomposition
- | | |
|-----------------------------------|---------------|
| A. Partition constraint | C. Redundancy |
| B. Dependency preservation | D. Security |
34. R (A,B,C,D) is a relation. Which of the following does not have a lossless join dependency preserving BCNF decomposition?
- | | |
|--|--|
| A. $A \rightarrow B, B \rightarrow CD$ | C. $AB \rightarrow C, C \rightarrow AD$ |
| B. $A \rightarrow B, B \rightarrow C, C \rightarrow D$ | D. $A \rightarrow BCD$ |
35. The algorithm that takes a set of dependencies and adds one schema at a time, instead of decomposing the initial schema repeatedly is
- | | |
|-------------------|-----------------------------------|
| A. BCNF algorithm | C. 3NF synthesis algorithm |
| B. 2NF algorithm | D. 1NF algorithm |
36. The functional dependency can be tested easily on the materialized view, using the constraints _____.
- | | |
|----------------|--------------------------------|
| A. Primary key | C. Unique |
| B. Null | D. Both Null and Unique |
37. Which normal form is considered adequate for normal relational database design?
- | | |
|--------|---------------|
| A. 2NF | C. 4NF |
| B. 5NF | D. 3NF |
38. Relation R with an associated set of functional dependencies, F, is decomposed into BCNF. The redundancy (arising out of functional dependencies) in the resulting set of relations is
- | | |
|-----------------------------------|--|
| A. Zero | B. More than zero but less than that of an equivalent 3NF decomposition |
| C. Proportional to the size of F+ | D. Indeterminate |
39. A table has fields F1, F2, F3, F4, and F5, with the following functional dependencies:
- | | | |
|---------------------|---------------------|---------------------------|
| $F1 \rightarrow F3$ | $F2 \rightarrow F4$ | $(F1, F2) \rightarrow F5$ |
|---------------------|---------------------|---------------------------|
- in terms of normalization, this table is in
- | | |
|--------|--------------------------|
| A. 1NF | C. 3NF |
| B. 2NF | D. None of the mentioned |
40. Let R(A,B,C,D,E,P,G) be a relational schema in which the following FDs are known to hold:
- | | | |
|---------------------|-------------------|-------------------|
| $AB \rightarrow CD$ | $C \rightarrow E$ | $B \rightarrow G$ |
| $DE \rightarrow P$ | $P \rightarrow C$ | |



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The relation schema R is

A. in BCNF

B. in 3NF, but not in BCNF

C. in 2NF, but not in 3NF

D. **not in 2NF**

41. The normal form which satisfies multivalued dependencies and which is in BCNF is

A. **4 NF**

B. 3 NF

C. 2 NF

D. All of the mentioned

42. Which of the following is a tuple-generating dependencies?

A. Functional dependency

B. Equality-generating dependencies

C. **Multivalued dependencies**

D. Non-functional dependency