



# VIT

Vellore Institute of Technology  
(Deemed to be University under section 3 of UGC Act, 1956)

## Continuous Assessment Test-I – January '23

Programme	: B.Tech CSE	Semester	: Win Sem(2022-23)
Course Title	: Database Systems	Code	: BCSE302L
		Class	: CH2022235000582
		Nbr(s)	: CH2022235000583
			: CH2022235000584
			: CH2022235000585
			: CH2022235000586
			: CH2022235000587
Faculty (s)	: Dr. Janani S M Dr. Leninisha Shanmugam Dr. Rishikeshan CA Dr. Tamilarasi K Dr. Brindha Dr. Jaisakthi S M	Slot	: B1+TB1
Time	: 90 Mins	Max. Marks	: 50 marks

### Answer all the Questions

1. Assume you are a database administrator for a marketing company. The creation and maintenance of a massive database are required by the business. The corporation has given you a number of duties, including database design, implementation, and management. Draw a clear diagram and consider how the three levels of the three-schema architecture relate to the responsibilities and duties of the database administrator.

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2. Answer the following questions:

i) Compare and contrast file Systems with database systems. [4 Marks]

ii) How the 3-tier architecture can be utilized to implement a web based online digital library. [3Marks]

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iii) Provide a suitable example from web based online digital library for Physical data independence and Logical data independence. [3Marks]

3. Examine the relational schemas given below and present the SQL queries for the following questions. (5\*2= 10 marks)

Employee relation	
Empnumber	
Empname	not null
mobilenumber	not null

Course relation	
Coursecode	Primary key
Coursename	unique
empno	Foreign key

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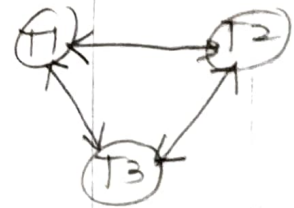
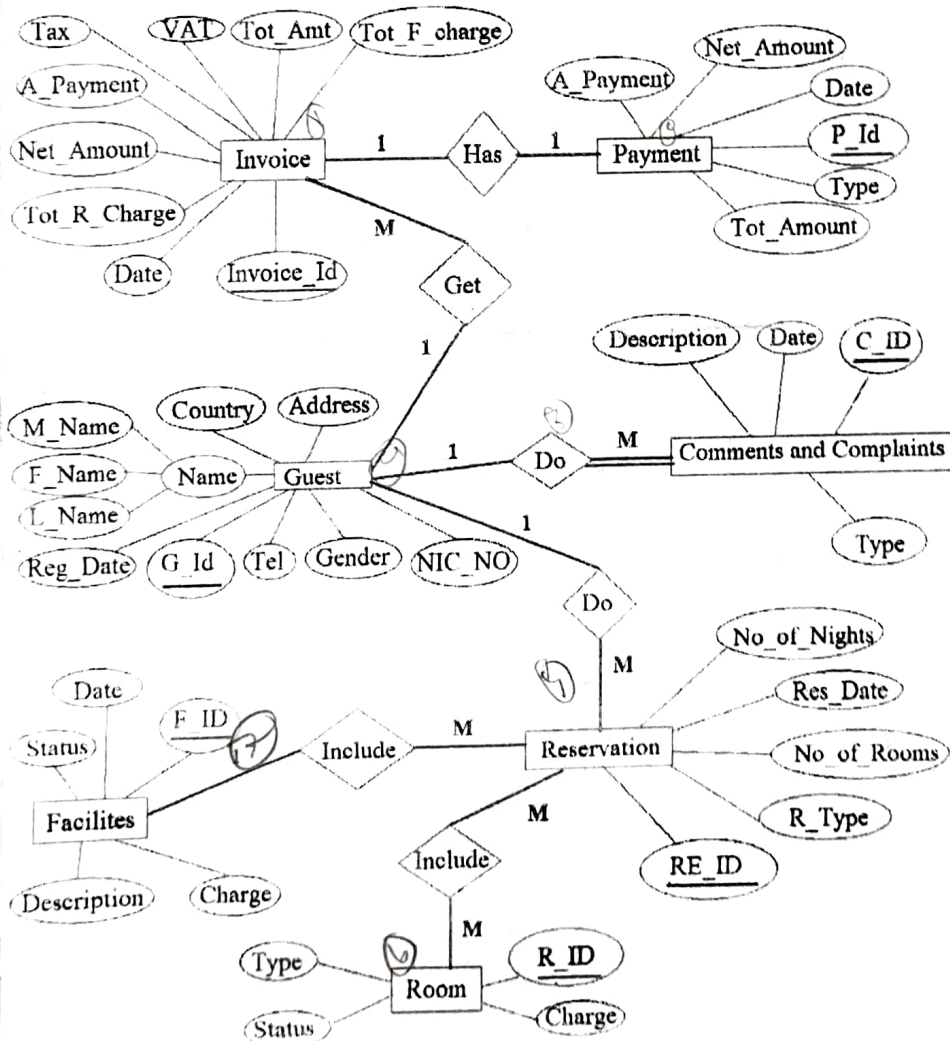
a) Consider the Employee relational schema given above, give the SQL query to

create table with given constraints, use appropriate data type.

- Present the suitable SQL Query to set the Empnumber attribute as primary key in an existing employee relation.
- Give the SQL Query to add a new attribute salary in the existing employee relation. Salary attribute should accept values only between 30000 and 40000, set the constraints accordingly.
- Consider the course relation, and present the SQL query to create the above relation, where the empno is the foreign key with cascade deletion and it refers to the Empnumber in the employee relation.
- Give the SQL query to drop the unique constraint associated with course name attribute in the course relation.

4. In a small multispecialty hospital there are doctors specialized in different departments. The hospital wants to automate and maintain the database of doctors, patients visiting the doctor, patients' history and the prescribed medicine. Assume you are a database designer and design a high level conceptual data model and represent the model with neat ER diagram.

5. Map the following ER diagram to Relational Schema with proper explanation. Specify all the constraints associated with each relation.



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Programme	: B.Tech CSE	Semester	: Win Sem(2022-23)
Course Title	: Database Systems	Code	: BCSE302L
		Class Nbr(s)	: CH2022235000588
			CH2022235000589
			CH2022235000590
			CH2022235000591
Faculty (s)	: Dr. Janani S M Dr. Leninisha Shanmugam Dr. Rishikeshan CA Dr. Tamilarasi K Dr. Brindha Dr. Jaisakthi S M	Slot	: B2+TB2
Time	: 90 Mins	Max. Marks	: 50 marks

Answer all the Questions

1. ABC software company is currently working on a project to create an user interface and a database to store information in an organized manner, for a famous hill resort at Ooty. Distinguish various database users and their roles related to this Resort database. Also, mention the need for using DBMS based approach for managing the Resort details.

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2. a) In a small multispecialty hospital, there are doctors specialized in different departments. The hospital maintains the information about doctors, patients visiting the doctor, patients' history and the prescribed medicine in a file system. Assume you are a database designer and try to convince the hospital authority to automate the existing system by explaining the drawbacks of the existing system and advantages of automating the system. (6 Marks)

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b) If you want to develop a web-based Library system for lending e-books, what kind of database utilities and tools and their functions do you require. (4 Marks)

3. Create the following tables and apply constraints as follows:

Books Table: isbn – primary key, qty – not null

Authors Table: authorId – primary key, email - unique

Book\_Authors: isbn – foreign key references books table, authorId – foreign key references authors table

Write SQL Queries for the following:

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a. Add unique constraint to title in books table.

b. Modify the not null constraint in price attribute in books table and set the check constraint so that value is greater than 0.0.

c. Set a default value of qty in books table as 0.

d. Remove the unique constraint for email attribute in authors table.

e. Drop a primary key [after referenced foreign key is dropped].



Database: mybookstore

Table: books

isbn: INT  
title: VARCHAR(50)  
price: FLOAT  
qty: INT

Table: books\_authors

authorID: INT  
isbn: INT

Table: authors

authorID: INT  
name: VARCHAR(30)  
email: VARCHAR(30)

books

isbn	title	price	qty
1001	Java for Dummies	11.11	11
1002	Only Java	22.22	22
1003	Java ABC	33.33	33
1004	Java 123	44.44	44

authors

authorID	name	email
1	Tan Ah Teck	teck@nowhere.com
2	Mohamed Ali	ali@somewhere.com
3	Kumar	kumar@abc.com
4	Kelvin Jones	kelvin@xzy.com

books\_authors

authorID	isbn
1	1001
2	1001
3	1001
1	1002
3	1002
2	1003
2	1004

4. VIT University Chennai campus wants to set up a new database to record the details of all the VIT staff employees and the details about the departments they are works in. They intend to record the following information.

- For each staff member: his or her staff ID, name, job title, and salary.
- For each department: the department name and address.
- For each staff member: all departments' details they belong to. It is required that every member of staff belongs to at least one department.
- Kids' information of each staff: kid's name, kid's age.
- For each department, there should be a head of the department. It is required that each department has exactly one head of the department.

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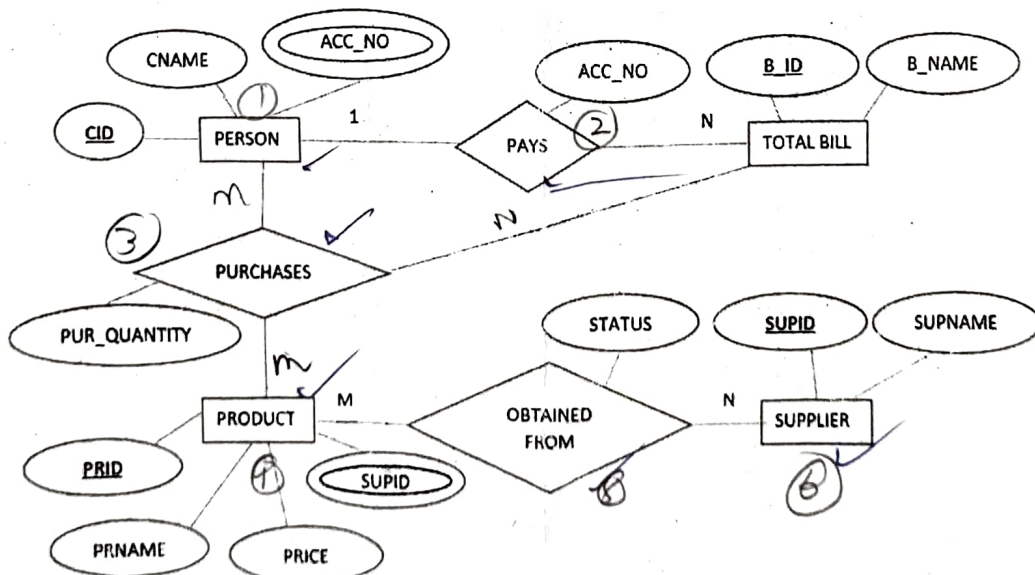
Draw an ER diagram that expresses the requirements for the above database. Make sure that you capture all the constraints on the data mentioned above.

5. Examine the given ER diagram for an online shopping application and present the relational schema for the same. Detail the steps used to convert the given ER diagram into relational schema.

- i) Step wise conversion with explanation for the given ER Diagram-  
ii) Relational schema results-

6 marks

4 marks



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