Reg. No [redacted]

Name

VIT®

BHOPAL

www.vitbhopal.ac.in

MID TERM EXAMINATIONS – March 2025

Programme	:	B.Tech.	Semester	:	Winter Semester 2024-25
Course Title	:	Database Management Systems	Course Code	:	CSE3001
Date and Session	:	03 March 2025/ Session I	Slot	:	A11+A12+A13
Time	:	1 ½ hours	Max. Marks	:	50

Answer all the Questions

Q.No.	Sub. Sec.	Question Description	Marks
1		**Design a database system for a small business:** Scenario: A pet store called "Pet Haven" that specializes in selling various kinds of pets, pet food, and pet accessories. The store has a physical location and an online store, and it also provides pet grooming and boarding services. The store has a staff of 5 employees, and they manage customer orders, inventory, pet records, and employee records manually using paper-based forms. Task: Design a database system for Pet Haven that can help them manage their operations efficiently. **Requirements:** 1. The system should be able to store information about different types of pets, their breeds, ages, genders, and medical records. 2. The system should be able to track the inventory of pet food and accessories, including their quantities, suppliers, and prices. 3. The system should be able to record customer orders, including the items ordered, the payment method, and the delivery date. 4. The system should be able to manage the schedules and appointments of pet grooming and boarding services, including the pet's name, owner's name, service type, and service date. 5. The system should be able to record employee information, including their names, contact details, job titles, and work schedules. 6. The system should be secure, reliable, and easy to use, and it should be accessible both from the physical store and the online store. Deliverables: 1. Identify and write down the entities, attributes, relationships, and constraints. 2. Draw the neat ER diagram.	10
2	(a)	With neat sketch, explain the architecture of DBMS and explain the relationship and interactions between the components within the system?	5
	(b)	Discuss advantages and disadvantages of Relational, Network and Hierarchical Data models	5
3		Explain the following DBMS key terms with an example: • Natural Join.	10

- Left Outer Join.
- Domain Constraints.
- Entity Integrity Constraints.
- Referential Integrity Constraints.

4 Consider the following table and answer the questions given below:

Table: Employees

Attributes: EmployeeID (Primary Key), EmployeeName, DepartmentID, DepartmentName, ManagerID, ManagerName

ii) Define 2NF and 3NF

iii) Insert some sample records in the table.

iv) Identify the functional dependencies of the above table.

v) Is this table in 2NF? Justify and normalize to 2NF if needed.

Is this table in 3NF? Justify and normalize to 3NF if needed. **10**

5 Consider the following table "EMP":

Attributes: empid, name, jobtype, manager_id, DOJ,salary, Commission, dept_no. **10**

EMpID	Name	JobType	ManagerID	DOJ	Salary	Commission	Dept_No
101	Alice Johnson	Manager	Null	15-06-2018	90000	Null	10
102	Bob Smith	Developer	101	23-08-2019	65000	1500	10
103	Carlie Brown	Developer	101	12-05-2020	62000	Null	10
104	David White	HR	Null	10-03-2017	55000	Null	20
105	Eva Green	Analyst	101	30-09-2021	70000	2000	10
106	Frank Adams	Developer	102	17-01-2022	60000	1000	10
107	Grace Lee	sales	101	25-11-2019	75000	5000	30
108	Henry Clark	HR	104	20-12-2018	52000	Null	20
109	Ivy Scott	Developer	102	08-07-2020	63000	Null	10
110	Jack Wilson	Manager	Null	05-02-2015	95000	Null	30

- Get the employee name, job type, and salary for all employees in department 20.
- Retrieve employees earning a salary greater than 50000, sorted by salary in descending order.
- Get the names of employees who do not have a manager (i.e., manager_id is NULL).
- List employees who joined the company after January 1, 2020.
- Find the total salary paid in each department.