REG.NO.:

SLOT: A2

VIT

Vellore Institute of Technology

SCHOOL OF COMPUTER SCIENCE AND ENGINEERING
CONTINUOUS ASSESSMENT TEST - I
WINTER SEMESTER 2025-2026

Programme Name & Branch	: B. Tech (CSE and BS) Course Code and
Course Name	: CBS1007 and Database Systems
Faculty Name(s)	: Prof. Anbarasi M & Prof. Rajasekar V
Class Number(s)	: VL2025260502069 & VL2025260502070
Date of Examination	: 27.1.2026
Exam Duration	: 90 minutes

Maximum Marks: 50

General Instruction(s):

- Answer All Questions

Course Outcomes

1. Acquire a good understanding of the architecture and functioning of database management systems
2. Ability to construct an ER model and derive the relational schemas from the model
3. Analyse and apply the principles and practices of good database design.

Q. No	Question	Module	Marks	CO	BL
1.	a. What are three often conflicting database requirements that must be addressed in database design? (5 M)	1	10	CO1	BL1
	b. How are database models related to the level of data abstraction? (5M)	1			
2.	Compare Hierarchical and Network models with neat diagrams.	1	10	CO1	BL5
3.	a. Consider the following schema: Passenger, where pid should be primary key, pname should be not be null and it should not exceed above 10 and age should not be null. (5M)	2	10	CO2	BL4

Reservation

pid	Class	Tid
1001	AC	5010
1005	SC	5201
1050	AC	5201
1005	TC	5203
1055	AC	5203
1080	AC	5204
1001	SC	5202
1050	UP	5202

Passenger

pid	pname	age
1001	Akshay Kumar	
1005	Vijay	40
1050	Aishwarya	55
1080	Bhumika	35
	Anushka	25
1050	Pavi	22

Do these relations satisfy all the constraints? If not specify the constraint violations in detail.

b. List the number of possible super keys for the given relation schema Emp (Eno, depentno, depentname, location) and candidate keys are Eno, depentno.(3M)

	c. Reason out why Parent Keys Not Found Error occur during the enforcement of foreign keys and how will you fix it with a suitable example.(2M)				
4.	The Prescriptions-R-X chain of pharmacies has offered to give you a free lifetime supply of medicine if you design its database. Given the rising cost of health care, you agree. Here's the information that you gather: • Patients are identified by an SSN, and their names, addresses, and ages must be recorded. • Doctors are identified by an SSN. For each doctor, the name, specialty, and years of experience must be recorded. • Each pharmaceutical company is identified by name and has a phone number. • For each drug, the trade name and formula must be recorded. Each drug is sold by a given pharmaceutical company, and the trade name identifies a drug uniquely from among the products of that company. If a pharmaceutical company is deleted, you need not keep track of its products any longer. • Each pharmacy has a name, address, and phone number. • Every patient has a primary physician. Every doctor has at least one patient. • Each pharmacy sells several drugs and has a price for each. A drug could be sold at several pharmacies, and the price could vary from one pharmacy to another. • Doctors prescribe drugs for patients. A doctor could prescribe one or more drugs for several patients, and a patient could obtain prescriptions from several doctors. Each prescription has a date and a quantity associated with it. You can assume that, if a doctor prescribes the same drug for the same patient more than once, only the last such prescription needs to be stored. • Pharmaceutical companies have long-term contracts with pharmacies. A pharmaceutical company can contract with several pharmacies, and a pharmacy can contract with several pharmaceutical companies. For each contract, you have to store a start date, an end date, and the text of the contract. • Pharmacies appoint a supervisor for each contract. There must always be a supervisor for each contract, but the contract supervisor can change over the lifetime of the contract. Draw an ER diagram that captures the preceding information. Identify any constraints not captured by the ER diagram.	2	10	CO2	BL6

VIT
Vellore Institute of Technology
REG.NO.:
SLOT: A2
SCHOOL OF COMPUTER SCIENCE AND ENGINEERING
CONTINUOUS ASSESSMENT TEST - I
WINTER SEMESTER 2025-2026

5.	a. Consider the following relation X Y Z 1 1 1 1 2 1 1 1 2 1 2 3 In this instance of the relation XYZ list any nontrivial functional dependencies that hold. Does this mean that the functional dependencies hold for the relation scheme XYZ? Why or why not? (5M) b. For relation R(X,Y,Z,W) with FDs {X→Y, Y→Z, XW→W}, prove that X→Z and XW→Z using inference rules. (5M)	3	10	CO3	B

.....