



VIT

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

REG.NO.:

SLOT: B2+ TB2

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

Programme Name & Branch : B.Tech - CSE and Specializations
 Course Code and Course Name : BCSE302L & Database Systems
 Faculty Name(s) : Applicable to All B2 slots
 Class Number(s) : Applicable to All B2 slots
 Date of Examination : 18.08.25
 Exam Duration : 90 minutes

Maximum Marks: 50

General instruction(s):

- Answer All Questions
- M - Max mark; CO - Course Outcome; BL - Blooms Taxonomy Level (1 - Remember, 2 - Understand, 3 - Apply, 4 - Analyse, 5 - Evaluate, 6 - Create)
- Course Outcomes:
 CO1: Comprehend the role of database management system in an organization and design the structure and operation of the relational data model.
 CO2: Develop a database project depending on the business requirements, considering various design issues.

Q. No	Question	M	CO
1.	<p>Examine the two situations listed below, which were seen in two distinct organizations:</p> <p>a) A global retail company intends to introduce a feature-rich online shopping platform. Consumers will use a mobile or web interface to peruse merchandise. The system uses a number of business rules when customers place orders, including figuring out shipping costs, comparing inventory across several warehouses, applying offers, and finally storing the transaction information in a central database. Additionally, the business wishes to make sure that changes to business logic, such as discount policies, may be implemented without immediately impacting the database structure or user experience.</p> <p>b) A small educational university uses a lightweight software application for managing its library operations. This software is installed on each librarian's desktop, and it allows them to search for books, issue and return books, and manage student records. It does not require frequent updates, and all operations are performed within the same installed application that connects to a database maintained within the campus premises.</p> <p>Based on the above situations, identify which architecture is more appropriate for the situation a) and situation b). Also, justify your selection by explaining how the components interact in each situation with neat diagram and why the chosen architecture is suitable.</p>	5	CO1
2.	Explicate the key characteristics of the database management system that distinguish it from traditional file-processing systems. Illustrate each characteristic with suitable examples.	10	CO1
3.	a) Consider a university database for the scheduling of classrooms for semester exams. This database could be modeled as the single entity set Exam, with attributes time and primary key exam_id. Along with this, three more entity sets	5	CO



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5. A university library maintains a record of borrowed books in the following unnormalized table: Column header expansion given below.
 srn – student register no, sname – student name, sph – student phone no,
 bid – book id, bname – book name, bd – borrow date, rd – return date,
 hbn – hostel block no, hbname – hostel block name.
 Here, srn and bid are primary keys. bd and rd must be determined by both primary keys srn and bid.

Given the following unnormalized table, convert it step by step into First Normal Form (1NF), Second Normal Form (2NF), and Third Normal Form (3NF), if violations of the corresponding normal forms exist. For each step, clearly identify the violation, justify why it violates the normal form, and then provide the appropriate decomposition to achieve the respective normal form.

srn	bid	sname	sph	bname	bd	rd	hbn	hbname
S1	B1	x	9876543210, 9123456780	DBMS	25-08-01	25-08-15	A	Anna
S2	B2	y	9988776655	OS	25-08-02	25-08-16	B	Gandhi
S3	B3	z	8899001122, 9000112233	CN	25-08-03	25-08-17	C	Nehru
S4	B4	w	9090909090	AI	25-08-04	25-08-18	D	Patel

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