PVP 20

II B.Tech - II Semester – Regular/Supplementary Examinations MAY- 2024

DATABASE MANAGEMENT SYSTEM
(INFORMATION TECHNOLOGY)

Duration: 3 hours   Max. Marks: 70

Note: 1. This paper contains questions from 5 units of Syllabus. Each unit carries 14 marks and have an internal choice of Questions.
2. All parts of Question must be answered in one place.

BL – Blooms Level   CO – Course Outcome

			BL	CO	Max. Marks
UNIT-I						
1	a)	Outline the various types of Database Languages.	L2	CO1	7 M
	b)	Differentiate Schema and Instances by considering the university Database.	L2	CO1	7 M
OR						
2	a)	Summarize the 3tier Database architecture components and its role.	L2	CO1	7 M
	b)	Explain the relational and object-oriented data models.	L2	CO1	7 M
UNIT-II						
3	a)	Discuss the various relational database constraints.	L2	CO3	7 M
	b)	Construct a relational model for a Library Management System having the following factors taken into account while tracking readers in the database: • A single-point authentication system that consists of a login ID and password, the system maintains track of the staff logs.	L3	CO3	7 M

	• The library staff updates the book collection with information on each title's ISBN, price in Indian rupees, category types (general, innovations, story), edition number, and unique author number. • A publisher has an ID number, the book title, and the year it was published. • Member register by providing a member ID, MailID, member name (first name and last name), • Contact number (multiple numbers are permitted) and contact address. The library staff monitors the readers. • Books with the issue and return date stamped can be considered reserved by readers. It can have a due date as well if it is not returned within the allotted time frame.			

<div align="center">OR</div>

4	a)	Summarize a non-procedural query languages in relational calculus at domain and tuple level with examples.	L2	CO2	7 M
	b)	Consider the following schema Employee (empno, name, office, age) Books (ISBN, title, authors, publisher) Loan (empno, ISBN, date) Use relational algebra to find the resultant set of the following queries. i) Find the names of employees who have borrowed a book Published by McGraw-Hill. ii) Find the names of employees who have borrowed all books Published by McGraw-Hill?	L2	CO2	7 M

		iii) Find the names of employees who have borrowed more than five different books published by McGraw-Hill. iv) For each publisher, find the names of employees who have borrowed.			
UNIT-III
5	a)	Describe the entity-relationship model with the significance of graphical components.	L2	CO5	7 M
	b)	Consider a railway reservation scenario and construct an ER diagram by including weak and strong entities, simple and composite attributes and a list of relationships that exist and cardinality.	L3	CO5	7 M
OR
6	a)	Explain the steps to relational database design by mapping with ER model.	L2	CO5	7 M
	b)	Consider the Insurance Plan Management System, a well-known and widespread issue in the modern world. For this issue, the Software Requirements Specifications (SRS) are as follows: i) The Insurance Provider includes numerous branches, each with a branch id, branch name, and address, location, contact information, fax, etc. ii) There are several staff members employed in each branch. For illustration, there is a Manager, field agents, staff members who work in development, secretarial assistants, etc. It keeps track of staff member's names, addresses, positions, salaries, and dates of employment or birth. iii) In addition to full-time employees, there are part-time workers known as	L3	CO5	7 M

insurance agents who are commission-based employees.

iv) The insurance provider is required to keep policyholder information on file, the policyholder address, tenure, maturity amount, policy number, and name.

Sketch a conceptual data model using E-R diagrams with Identified entity types and attributes related to entity and relationships.

UNIT-IV

7	a)	Illustrate Inference rules of DBMS using Armstrong Axioms.	L2	CO4	7 M
	b)	Let X, Y, Z be a set of attributes of Relation R. Prove that if FD1: X→YZ and FD2: X→Y then FD3: X→Z also exists.	L2	CO4	7 M

OR

8	Compare the properties of each normal form in database design.	L2	CO4	14 M

UNIT-V

9	a)	Summarize concurrency control protocols to ensure the ACID properties and serializability of the concurrent execution of the database transactions.	L2	CO1	7 M
	b)	Explain how 2 phase locking protocol prevents the interference between two concurrent transactions.	L2	CO1	7 M

OR

10	a)	Discuss how serializability is used for concurrency control.	L2	CO1	7 M
	b)	Explain various recovery Protocols in detail.	L2	CO1	7 M