

SCHOOL OF COMPUTER SCIENCE AND ENGINEERING
CONTINUOUS ASSESSMENT TEST - I
FALL SEMESTER 2026-2027

Programme Name & Branch: **B.Tech**
 Course Code and Course Name : **BACSE202- DATABASE SYSTEMS**
 Faculty Name(s) : **Anbarasi, Mohankumar, Jyotismita Chaki, Saritha, Konatham Sumalatha, Pooja Choudhary, Lakshmi, Diviya, Sudhakar, Vani Rajasekar, Manohar kumar, Avishek Nandi, Kavitha, Somasundaram, Katari Balakrishna, Jothiaruna, Arunkumar S**
 Class Number(s) : **VL2026270101644,1648,1655,1658,1660,1664 1668, 1670, 1679, 1683, 1687, 1692, 1699, 1704, 3066,1673**
 Date of Examination : **9.8.2026**
 Exam Duration : **90 minutes** **Maximum Marks: 50**

General instruction(s):

Answer All Questions

Course Outcomes:

1. Understand the role of database management systems in organizations and design relational data models and their operations.
2. Analyze and apply indexing structures for efficient data access and query optimization.
3. Gain insight into transaction management, concurrency control, and recovery mechanisms in databases.
4. Demonstrate knowledge of distributed databases and NoSQL databases.
5. Apply database design principles to create scalable and maintainable data models for real-world systems.

Q. No	Question	M	CO	BL
1.	CityCare Hospital is a multispecialty hospital that serves nearly 1,200 patients daily through several departments, including Reception, Emergency, Outpatient (OPD), Inpatient (IPD), Doctors, Laboratory, Pharmacy, Radiology, Billing, Insurance, and Administration. The hospital currently relies on a file-based record management system. This approach has resulted in data redundancy, inconsistencies, delays in information retrieval, and difficulties in maintaining data accuracy and quality. To improve operational efficiency, minimize errors, reduce rework, save time and resources, and enhance the overall quality of patient care, the hospital has decided to implement a Hospital Management System (HMS) that stores all information in a centralized database. Based on the above scenario, answer the following questions: 1. Identify and explain any five advantages of adopting the Hospital Management System (HMS) over the existing paper-based and file-based system. 2. With reference to the Hospital Management System (HMS), explain how the three-schema (three-level) database architecture is implemented. Support your answer with an appropriate illustration, clearly identifying the External, Conceptual, and Internal levels.	5 5	CO1	3
2.	TechMart Pvt. Ltd. is a retail company that sells electronic products, including laptops, mobile phones, printers, and accessories, through multiple branches. The company currently manages inventory using separate spreadsheets maintained by	10		



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each branch, resulting in data redundancy, inconsistent stock information, delayed updates, and inaccurate inventory reports. To overcome these issues, TechMart plans to implement an **Inventory Management System (IMS)** based on a relational database. The system will centrally manage information related to products, suppliers, branches, customers, employees, purchase orders, sales transactions, and inventory levels.

The IMS must satisfy the following business rules:

- Every **Product** is uniquely identified by a **Product ID**.
- Every **Supplier** is uniquely identified by a **Supplier ID**.
- Every purchase order must reference an existing supplier.
- Every sales transaction must include only products available in the inventory.
- Product quantities must be zero or greater.
- Every inventory record must reference a valid product and a valid branch.

Based on the Inventory Management System (IMS) described above, design an appropriate relational database schema. Clearly identify the primary keys and foreign keys, and explain how the relational model constraints (domain, key, entity integrity, and referential integrity constraints) are applied to ensure data integrity.

CO1 3

3. Illustrate the different types of data models used in database architecture. Support your answer with suitable examples from database management systems.

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4. **Library Management System**

- A college library maintains information about **books, members, publishers, and book loans**. Each **book** is uniquely identified by a **Book ID** and includes details such as title, author, category, publication year, and publisher. Each **member** is identified by a unique **Member ID** and has attributes such as name, department, phone number, and email.
- Members can borrow multiple books, while each book copy can be issued to only one member at a time.
- The system records the **issue date, due date, and return date** for every book loan. Each **publisher** may publish multiple books, whereas every book is associated with exactly one publisher.

Identify the **entities, attributes, relationships**. Draw the ER diagram specifying the cardinality across each relationship.

10 CO5 3

Student_ID	Course_ID	Student_Name	Course_Name	Instructor	Grade
S101	C201	Aryan	Database Systems	Dr. Shiva	A
S101	C202	Ajay	Operating Systems	Dr. Shakti	B+
S102	C201	Aakash	Database Systems	Dr. Shiva	A-
S103	C203	Akshay	Computer Networks	Dr. Ganesh	B

Identify the functional dependencies from the above records and classify each as either a partial functional dependency or a full (total) functional dependency. Justify your classification with appropriate reasoning.

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