Seat No. /Enrollment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY
MBA INTEGRATED-SEMESTER-II-EXAMINATION-WINTER-2024

Subject Code: 2527107 **Date: 26/12/2024**

Subject Name: Database Management System

Time: 02:30 PM TO 05:30 PM **Total Marks: 70**

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**
4. **Use of simple calculators and non-programmable scientific calculators are permitted.**

Q. No.		Question Text and Description	Marks
Q.1		(a) Database (b) DBMS (c) SQL (d) DDL (e) Entity (f) Candidate key (g) Functional Dependency	**14**
Q.2	**(a)**	Identify and explain different types of users interacting with DBMS.	**07**
	(b)	Discuss DML, TCL, DCL statements in brief.	**07**
		OR	
	(b)	Discuss 3-Layer architecture of data base management system and explain each of them in brief.	**07**
Q.3	**(a)**	What is Generalization? Discuss super class and sub class with an example.	**07**
	(b)	What is Cardinality ratio? Explain each type of cardinality relation with an example of each.	**07**
		OR	
Q.3	**(a)**	Define and discuss primary key and foreign keys with an example.	**07**
	(b)	What is attribute of an entity? Discuss different types of attributes in brief.	**07**
Q.4	**(a)**	What is Normalization? Discuss 3rd NF in brief.	**07**
	(b)	Discuss Super key and Candidate key keys with an example.	**07**
		OR	
Q.4	**(a)**	What is Referential integrity? Explain it with an example.	**07**
	(b)	Identify the following functional dependencies for relation R is in which normal form. If it is not in 3rd NF, then normalize it to 3rd NF. R (A, B, C, D, E, F) ABC -> D ABD -> E CD -> F CDF -> B BF -> D	**07**

Q.5 CASE STUDY: Library Management System

Introduction:
A library management system (LMS) is a crucial component of any educational institution or community space. It helps in efficiently managing library resources, tracking borrowing and returning of books, and providing various services to patrons. Consider the case of a university library implementing an LMS to streamline its operations.

Scenario:
The university library, with a vast collection of books, periodicals, and digital resources, decides to upgrade its manual system to a computerized library management system. The system aims to automate processes such as book circulation, cataloging, and inventory management. Additionally, it should provide users with online access to the library catalog and facilitate reservations and renewals.

Functional Requirements:

1. User Management: The system should allow librarians to add, delete, and update user information, including students, faculty, and staff. Each user should have a unique identifier and borrowing privileges based on their membership type.
2. Catalog Management: Librarians should be able to add new books to the catalog, update existing entries, and remove obsolete ones. Each book entry should include details such as title, author, ISBN, publication year, genre, and availability status.
3. Circulation Management: The system should facilitate the borrowing and returning of books by users. It should maintain a record of borrowed books, due dates, and fine calculations for overdue items. Users should be able to check their borrowing history and renew items online if they are not overdue.
4. Search and Reservation: Users should be able to search the library catalog by title, author, genre, or ISBN. They should also be able to reserve available books online and receive notifications when the reserved items are ready for pickup.

(a) Explain the importance of a database management system (DBMS) in the context of a library management system. How does a DBMS facilitate efficient data storage, retrieval, and manipulation for library operations? **07**

(b) Discuss the normalization process in the design of the library database schema. Identify and explain at least two normalization forms applicable to the library management system case study. **07**

OR

(a) Draw an ER diagram for the school management system. **07**

(b) Convert the ER-Diagram into relational model and prepare data-dictionary for Library management system. **07**

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