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

School of Computer Science and Engineering

Summer Semester 2023-24

Mid-Term

SLOT: A1+TA1+A2+TA2

Programme Name & Branch: B.Tech & CSE

Course Name & Code: Database Systems & BCSE302L

Class Number (s): VL2023240700278

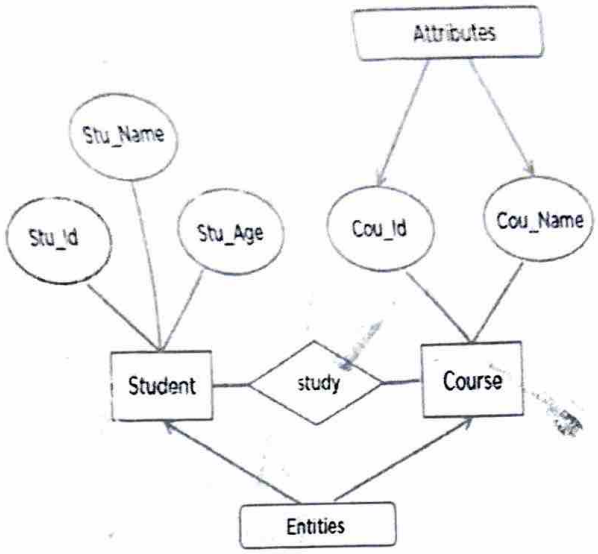
Faculty Name :Deepika S Id: 18971

Exam Duration: 90 Min. **Maximum Marks: 50**

General instruction(s):

Answer All Questions:

Q. No.	Question	Max Marks
1.	Explain how you would structure a 2-tier database system for a small bookstore. This system should allow customers to browse books and make purchases through a client interface, while enabling staff to manage inventory and sales through a server-side backend. Describe the components and interactions within this architecture.	10
2.	Explain the concept of an Entity-Relationship (ER) model in database design. How does it help in representing the logical structure of a database? Provide an example scenario and demonstrate how you would use entities, attributes, and relationships to model the data.	10
3.	a)In database design, domain constraints play a crucial role in ensuring data integrity and validity. Describe the different types of domain constraints. Then, explain how domain constraints contribute to maintaining data quality and consistency within a database system. (5Marks) b) Identify the primary entities in the ER diagram given below, involving students and courses. List all attributes associated with the "Student" entity. Describe the relationship between the "Student" and "Course" entities, and outline the attributes associated with the "Course" entity.(5Marks)	10



4.	a)Explain the concept of multivalued functional dependencies (MVDs) in database normalization using an example. Illustrate a scenario where MVDs occur within a database schema and discuss how they differ from traditional functional dependencies."(6 Marks)	10
	b) Given a university's course registration system schema including 'Students' table (student_id, student_name, course_id, course_name, instructor_name), discuss Second Normal Form (2NF). Identify any 2NF violations in the 'Students' table and propose normalization steps. Highlight the significance of 2NF in enhancing data integrity and minimizing redundancy." (4Marks).	
5.	Explain the concept of a join operation in relational database management systems (RDBMS). Using a hypothetical scenario of two tables - 'Orders' (order_id, customer_id, order_date) and 'Customers' (customer_id, customer_name, city) - demonstrate how an SQL join operation can be applied to retrieve data. Discuss different types of joins, such as INNER, LEFT, RIGHT, and FULL, and provide examples of when each type is used."(10)	10