Name: **Enrolment No:**	

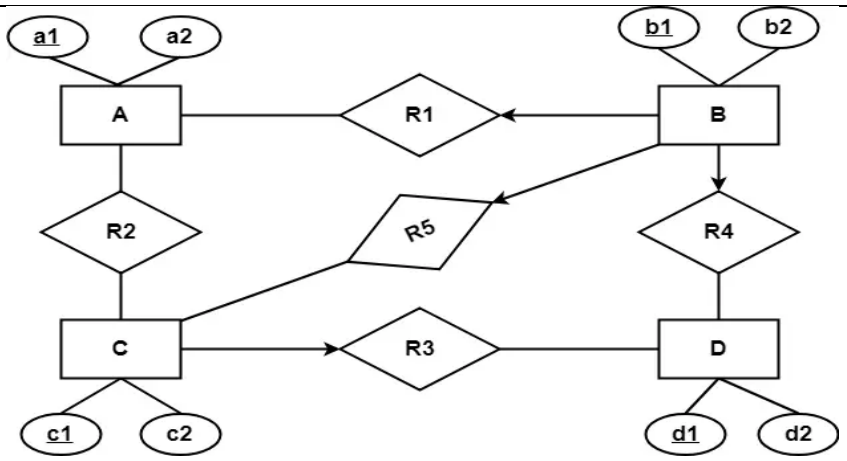
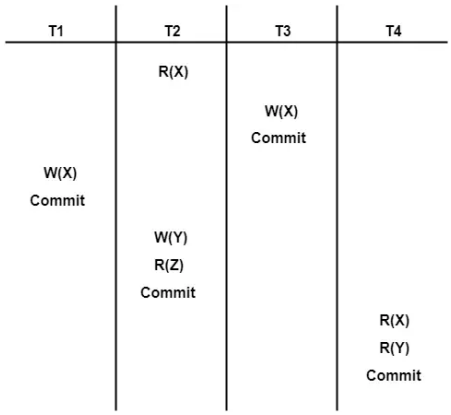
UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, December 2023

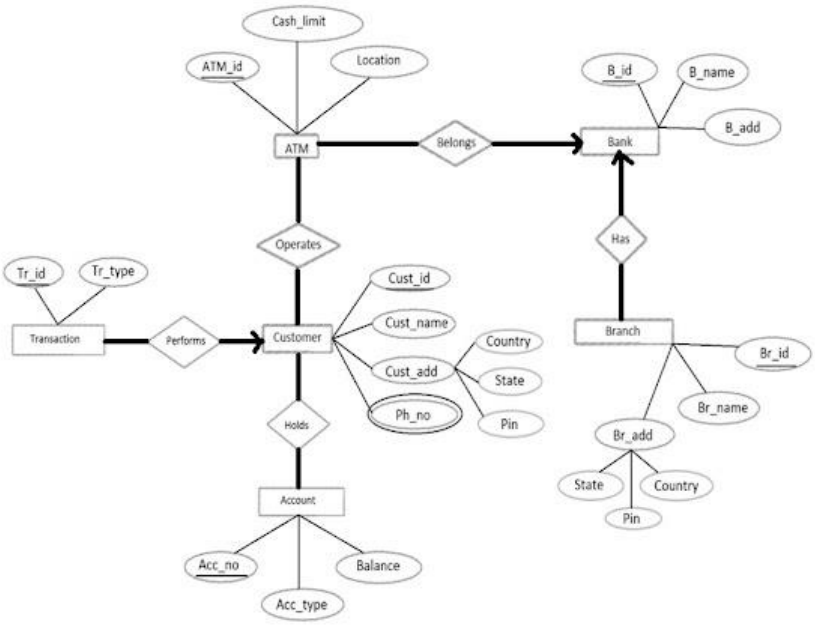
Course: Advanced Database Management Systems **Semester: I**
Program: M.Tech. **Time: 03 hrs.**
Course Code: CSEG 7002 **Max. Marks: 100**

Instructions: Attempt all questions.

SECTION A
(5Qx4M=20Marks)

S. No.		Marks	CO
Q 1	Write about the concept of Entity integrity in a database management system. Provide an example of how Entity integrity is enforced in a relational database.	**4**	**CO1**
Q2	Give a brief about the multidimensional data model.	**4**	**CO5**
Q3	Compare and contrast the advantages and disadvantages of these file organization methods in terms of data access, insertion, and deletion.	**4**	**CO3**
Q4	Provide an overview of how log-based recovery works, its significance in ensuring data consistency, and its key components.	**4**	**CO2**
Q5	Provide a concise overview of the steps in the distributed database from query parsing and optimization to query execution, highlighting the significance of each stage in the context of improving database performance."	**4**	**CO4**
SECTION B **(4Qx10M= 40 Marks)**			
Q 6	Explain Saga in the context of distributed transactions, including its structure and components, as well as how it ensures eventual consistency in distributed systems. Provide a real-world example to illustrate the application of Saga in managing distributed transactions and maintaining data consistency.	**10**	**CO4**
Q 7	Explain the role of timestamps in transaction scheduling and conflict resolution. Provide a detailed description of the concept of timestamps and how they contribute to maintaining transaction order and resolving conflicts in a database system.	**10**	**CO2**
Q8	Describe the structure and purpose of hash functions, emphasizing their distribution and collision resolution strategies.	**10**	**CO3**
Q 9	a) Find the minimum number of tables required to represent the given ER diagram in the relational model:	**5+5 10**	**CO1 +CO 5**

	 b) Discuss the concept of data warehousing and its role in a relational database environment.		
SECTION-C (2Qx20M=40 Marks)			
Q 10	a) Check whether the given schedule S is conflict serializable and recoverable or not-  b) Explain how data is physically organized in a table with a clustered index compared to a table with a secondary index.	**10+ 10**	**CO2 +CO 3**
Q 11	Convert the following ER diagram to a set of relational schemas specifying schemas for strong entity sets composite attributes, Multi-valued attributes, and relationship sets.	**20**	**CO1**



OR

Q 11

a) Define 3NF and its primary objective in relational database design. Provide an example of a relation that is not in 3NF, demonstrate the process of normalizing it to 3NF, and explain the resulting benefits in terms of data integrity and redundancy reduction."

b) Given a relation R (A, B, C, D) and Functional Dependency set FD = { AB → CD, B → C }, determine whether the given R is in 2NF. If not convert it into 2 NF.