

GUJARAT TECHNOLOGICAL UNIVERSITY**MCA - SEMESTER- III EXAMINATION – WINTER 2019****Subject Code: 4639303****Date: 21-12-2019****Subject Name: Database Management Systems****Time: 10.30 am to 1.00 pm****Total Marks: 70****Instructions:**

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q. 1 (a) Do as directed: **07**

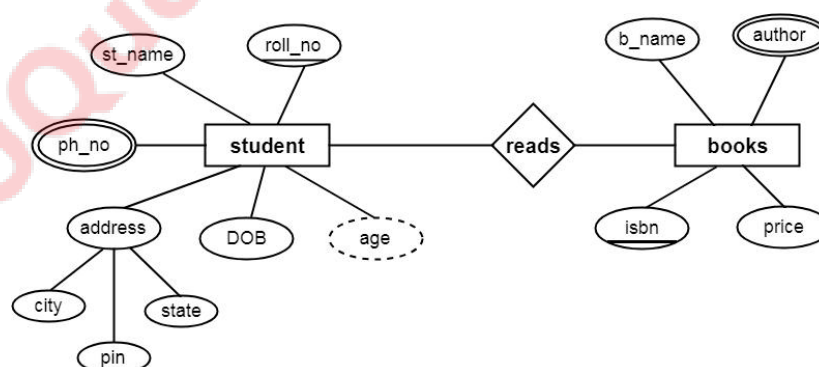
1. Define - Database Management System.
2. State any two advantages of DBMS.
3. State the difference between database and database system.
4. What is data independence? List its types.
5. Differentiate between Schema and Instance for a database.
6. Identify the major advantage of centralised over client/server architecture.
7. List the criteria for classification of databases.

Q. 1 (b) Differentiate between the following terms:

- | | |
|--|-----------|
| 1. ER model and Relational model | 02 |
| 2. Strong and Weak entity | 02 |
| 3. Specialisation and Generalization | 02 |
| 4. Internal and Conceptual level of DBMS | 01 |

Q. 2 (a) Define Normalization. State all the normal forms, and explain them with appropriate examples. **07**

Q. 2 (b) Convert the below mentioned ER model into its equivalent relational model: **07**

**OR**

Q. 2 (b) Consider the online Marks entry system for the students of MCA. Identify the entities, relations and attributes needed for it, and prepare an ER Model representing it. **07**

- Q. 3 (a)** Consider the below attributes and perform 3 stages of Normalization, along with example of sample records: **07**
 Custno, Cname, City, Billno, Billdate, Pid, Pname, Ptype, Price.
 Note : There are frequent updates in Price required.
- Q. 3 (b)** Describe the relational algebra with appropriate examples: **04**
 1. Set operations. **03**
 2. Selection, Projection and Division. **03**
- OR**
- Q. 3 (a)** Assume the below mentioned list of fields, identify the entities by performing 1NF, 2NF and 3NF, by showing at least 3 tuples in each. **07**
 Ownercode, Oname, Ocartype, Invoiceno, IDate, ItemCode, Iname, Iamount.
 Note : There are frequent updates needed in OCarType .
- Q. 3 (b)** Explain the following concepts: **04**
 1. Aggregate functions and grouping. **03**
 2. Generalised projection. **03**
- Q. 4 (a)** Write a note on relational model constraints. **07**
- Q. 4 (b)** Explain the schedule based on recoverability and serializability, with its example. **07**
- OR**
- Q. 4 (a)** Explain in brief about relational database schemas. **07**
- Q. 4 (b)** What is transaction? Describe the desirable properties of Transactions. **07**
- Q. 5 (a)** What is a deadlock ? Explain in detail - Two phasing locking mechanism. **07**
- Q. 5 (b)** Explain in detail the recovery based on Deferred update, with example. **07**
- OR**
- Q. 5 (a)** Why is concurrency control required? Explain it based on timestamp ordering. **07**
- Q. 5 (b)** Write a note on Shadow Paging. **07**
