[Time: 3 Hours]   **[Marks:80]**

Please check whether you have got the right question paper.

N.B: 1. Question No.1is **Compulsory.**

2. Attempt any 3 questions out of rest.

3. Make suitable assumptions if any.

4. All questions carry equal marks.

Q.1	a)	Differentiate between file system and database system with an example	**05**
	b)	Explain Referential Integrity with suitable example	**05**
	c)	List the steps required to map ER , EER model to relational model	**05**
	d)	Explain the ACID properties of transactions	**05**

Q.2   a) Explain the following Relational Algebra operations with suitable example.   **10**

        a) Project   b) Select

        c) Union   d) Cartesian Product

   b) Construct an EER diagram and convert into Relational Model for a library   **10**

Management System.

Specify 2 complex SQL queries on the above-one using Group by clause and the other

using Join operation with an example

Q.3   a) Explain the following terms with an example:-   **10**

    i) Natural join.   ii)Set Intersection.   iii)Weak Entity.   iv) Foreign key

   b) Explain the Overall Architecture of DBMS in detail. .   **10**

Q.4   a) Define Deadlock. Explain how deadlock can be handled   **10**

   b) Explain Specialization and Generalization with suitable example   **10**

Q.5   a) For the schema mentioned below   **10**

               Employee(eid, ename, address, city)   Works(eid, cid, salary)

               Company(cid, cname, city)

               Create an ER diagram for the same and Specify the SQL queries for each

               of the statements given below

       1) Modify database so that John now lives in Mumbai, assuming the database entry has John staying in Delhi.

       2) Find Employees who live in same city as the company for which they work.

       3) Give all employees of"AZ Corporation" whose salary has increased by15% in the year 2018-19.

    b) Define the term Normalization as used in database design. Explain the various normal   **10**
       forms with an example

Q.6   Write short notes on **any two**   **20**

       a) Log based recovery mechanism

       b) Triggers and transaction control commands

       c) Conflict and View Serializability

       d) Data Independence