

Reg. No. 

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**B.E. / B.TECH. DEGREE EXAMINATIONS, MAY 2023**

Third Semester

**AD18302 – INTELLIGENT DATABASE MANAGEMENT SYSTEMS**

(Regulation 2018)

**TIME: 3 HOURS**

**MAX. MARKS: 100**

- CO 1** To learn the fundamentals of data models and to conceptualize and depict a database system using ER diagram
- CO 2** To make a study of SQL and relational database design
- CO 3** To learn about the internal storage structures using different file and indexing techniques which will help in physical DB design.
- CO 4** To know the fundamental concepts of transaction processing- concurrency control techniques and recovery procedure.
- CO5** To have an introductory knowledge about the Storage and Query processing Techniques and NoSQL.

**PART- A (10 x 2 = 20 Marks)**

(Answer all Questions)

	CO	RBT LEVEL
1. What is a data model? List the type of data model.	1	2
2. Differentiate between Dynamic SQL and Static SQL.	1	4
3. Discuss about Transitive Functional dependency.	2	2
4. Justify why 3.5 Normal Form is the Strongest Normal Form?	2	4
5. List down the various phases of validation based protocols.	3	1
6. List the properties of ACID.	3	2
7. Exemplify cascaded rollback mechanism.	4	2
8. Relate hot swapping in disk replacement.	4	3
9. Write a syntax for Spatial Databases.	5	1
10. List the features for Deductive databases.	5	1

**PART- B (5 x 14 = 70 Marks)**

	Marks	CO	RBT LEVEL
11. (a) Detail the operations of Relational Algebra and the purpose of each with examples.	(14)	1	2

(OR)

- (b) Consider the following relations:  
**EMPLOYEE (ENO, NAME, DATE, GENDER, DATE OF JOINING, DESIGNATION, BASIC PAY, DNO)**  
**DEPARTMENT (DNO, DNAME)**  
 Write SQL queries to perform the following
- (i) List all the employees whose name ends with letter 'E'
  - (ii) Find the maximum salary and minimum salary given to employees in each department
  - (iii) List the record ENO, ENAME in descending order based on BASIC PAY
  - (iv) List the details of employees who work for DNAME= "ADS".

(14) 1 2

12. (a) Consider the scenario and draw ER Diagram for the Company database. (14) 2 3

The Company database keeps track of company's employee, dept and projects. We store Employee's ID, name, address, salary, gender, date of Birth and Age. An employee is assigned to one dept, but may work on several projects which are not necessarily controlled by the same dept. A particular employee manages the department Each dept has a unique name, unique number and several locations. The dept controls no. of projects each of which has a unique name, unique number and a single location. We want to keep track, of the dependents of each employee for Insurance purpose. We keep each dependent's first name, sex, DOB and relationship to employee.

**Note: Use all the Symbols in the ER-Diagram**

(OR)

- (b) Express the need eliminate undesirable characteristics in Normalization and explain the various Normal Forms (1st,2nd,3rd,BCNF,4th,5th) with suitable examples. (14) 2 3

13. (a) Illustrate Lock based protocol and time stamp based protocol in detail with suitable diagram. (14) 3 4

(OR)

- (b) Outline the concepts of Conflict and View serializability and how the conflict serializability is tested? (14) 3 4

14. (a) Elaborate the various steps involved in Query processing. How would you estimate the cost of the query optimization? (14) 4 2

(OR)

(b) Interpret Hash based Indexing and Tree based Indexing mechanism in detail. (14) 4 2

15. (a) Outline the active database Syntax and Semantics features with suitable example. (14) 5 4

(OR)

(b) Examine how hierarchical data is maintained in relational databases using Recursive Queries in SQL? (14) 5 4

**PART- C (1 x 10 = 10 Marks)**

(Q.No.16 is compulsory)

	Marks	CO	RBT LEVEL
16. Explore the various levels in handling the disk failure with suitable diagram.	(10)	4	3