

Code: CS5T1

**III B.Tech - I Semester – Regular/Supplementary Examinations
March 2021**

**DATABASE MANAGEMENT SYSTEMS
(COMPUTER SCIENCE AND ENGINEERING)**

Duration: 3 hours

Max. Marks: 70

PART – A

Answer *all* the questions. All questions carry equal marks

11x 2 = 22 M

1.

- a) Define and differentiate Data and Information.
- b) Describe Instance and Schema of database.
- c) How would you classify the Query languages?
- d) State about PROJECT operation in Relational algebra.
- e) What is a foreign key constraint? Why such constraints are important?
- f) What are key constraints and participating constraints?
- g) Can you list the problems caused by the redundancy.
- h) What is Multi valued dependency?
- i) Can you elaborate the definition of transaction and mention transaction properties.
- j) Can you list the various data base recovery techniques.
- k) How are primary keys related to FD's?

PART – B

Answer any **THREE** questions. All questions carry equal marks.

3 x 16 = 48 M

2. a) Compare and Contrast file Systems with database system?

8 M

b) Explain the difference between two-tier and three-tier architectures. Which is better suited for Web applications.

Why?

8 M

3. Construct queries for the following questions using the given

Emp table

10 M

ID	NAME	AGE	ADDRESS	SALARY
1	Ramesh	32	Ahmedabad	2000.00
2	Khilan	25	Delhi	1500.00
3	kaushik	23	Kota	2000.00
4	Chaitali	25	Vijayawada	6500.00
5	Hardik	27	Bhopal	8500.00
6	Komal	22	Hyderabad	4500.00
7	Muffy	24	Vizag	10000.00

a) Write SQL Queries for the following

- i. Display the details of employees whose salary is between 2000 and 7000.
- ii. Display the details of first three employees
- iii. Display the details of employees according to the descending order of their salary values.

- iv. Display the details of employees whose age >25 or salary is not less than 2000. (duplicates are allowed)
- v. Display the details of employees whose age is same as others with the count is at least 2.

b) Explain different types of joins in Relational Algebra.

6 M

4. Consider the following database, A university database contains information about professors (identified by social security number, or SSN) and courses (identified by courseid). Professors teach courses; each of the following situations concerns the Teaches relationship set.

a) Explain the following terms briefly for the above description: attribute, domain, entity, relationship, entity set, relationship set.

6 M

b) For each situation, Design ER diagram that describes it (assuming no further constraints hold).

10 M

- i. Professors can teach the same course in several semesters, and each offering must be recorded.
- ii. Professors can teach the same course in several semesters, and only the most recent such offering needs to be recorded. (Assume this condition applies in all subsequent questions).
- iii. Every professor must teach some course.

- iv. Every professor teaches exactly one course (no more, no less).
- v. Every professor teaches exactly one course (no more, no less), and every course must be taught by some professor.

5. a) Consider the following relational schemes for a library database:

Book (Title, Author, Catalog_no, Publisher, Year, Price)

Collection (Title, Author, Catalog_no) , the following are functional dependencies:

- i. Title, Author --> Catalog_no
- ii. Catalog_no --> Title, Author, Publisher, Year
- iii. Publisher, Title, Year --> Price
- iv. Assume {Author, Title} is the key for both schemes.
Apply the appropriate normal form for Book and Cancellation. 8 M

b) Define decomposition and how does it address redundancy. Discuss the problems that may be caused by the use of decompositions. 8 M

6. a) Discuss two phase locking protocol and strict two phase locking protocols. 8 M

b) Explain these terms: conflict-serializable schedule, view-serializable schedule & Shadow Paging technique. 8 M