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Course Code 

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Fifth Semester B.E. Degree Examinations, September/October 2024

**DATABASE MANAGEMENT SYSTEMS**

(Common to CSE &amp; AIML)

Duration: 3 hrs

Max. Marks: 100

*Note:* 1. Answer any FIVE full questions choosing ONE full Question from each Module.  
2. Missing data, if any, may be suitably assumed

<u>Q. No</u>	<u>Question</u>	<u>Marks</u>	<u>(RBTL:CO:PI)</u>
<b>Module-1</b>			
1.	a. Write a note on actors on the scene.	<b>04</b>	(2 :1 : 1.6.1)
	b. Discuss the main characteristics of database approach over the file processing approach.	<b>08</b>	(2 :1 : 1.6.1)
	c. Discuss the database system environment with a neat block diagram.	<b>08</b>	(3 :1 : 1.6.1)
<b>OR</b>			
2.	a. List the different types of user-friendly interfaces of DBMS and explain any two.	<b>04</b>	(2 :1 : 1.6.1)
	b. Explain three-schema architecture with a neat diagram.	<b>08</b>	(2 :1 : 1.6.1)
	c. Illustrate with example, the steps involved in converting the ER diagram to corresponding relational tables.	<b>08</b>	(3 :1 : 1.7.1)
<b>Module-2</b>			
3.	a. Discuss all forms of ALTER command with syntax and examples.	<b>06</b>	(2 :2 : 2.7.1)
	b. Write a syntax to create and query the view with example.	<b>06</b>	(2 :2 : 2.7.1)
	c. Discuss nested subqueries with example.	<b>08</b>	(2 :2 : 3.6.2)
<b>OR</b>			
4.	a. Write a syntax of Insert and update command. Illustrate both with examples.	<b>06</b>	(2 :2 : 2.7.1)
	b. Explain the usage of aggregate functions in SQL. Write SQL query to find minimum, maximum, and average marks of all students	<b>08</b>	(2 :2 : 2.7.1)
	c. <b>Consider the following schema for Order Database:</b> SALESMAN (Salesman_id, Name, City, Commission) CUSTOMER (Customer_id, Cust_Name, City, Grade, Salesman_id) ORDERS (Ord_No, Purchase_Amt, Ord_Date, Customer_id, Salesman_id) (i) Identify entities (ii) Identify primary keys and foreign keys (iii) Construct Schema-Diagram (iv) Construct ER-Diagram	<b>06</b>	(3 :2 : 2.7.1)
<b>Module-3</b>			
5.	a. Discuss the clauses used to retrieve data from relations.	<b>04</b>	(2 :3 : 2.6.2)
	b. Demonstrate the following concepts with syntax and example (i) Assertions in SQL (ii) Triggers in SQL	<b>08</b>	(2 :3 : 2.7.1)

- c. Illustrate with example, how EXISTS, NOT EXISTS and UNIQUE functions are used in SQL **08** (2 :3 : 3.6.2)

**OR**

6. a. Demonstrate stored procedure in SQL with suitable example **04** (2 :3 : 3.6.2)
- b. Demonstrate the concept of *rank* () - advanced aggregation using suitable example. **08** (2 :3 : 2.7.1)
- c. **Consider the schema for Movie Database:** **08** (3 :3 : 3.6.2)  
 ACTOR(Act\_id, Act\_Name, Act\_Gender)  
 DIRECTOR(Dir\_id, Dir\_Name, Dir\_Phone)  
 MOVIES(Mov\_id, Mov\_Title, Mov\_Year, Mov\_Lang, Dir\_id)  
 MOVIE\_CAST(Act\_id, Mov\_id, Role)  
 RATING(Mov\_id, Rev\_Stars)  
 Solve queries in SQL to  
 (i) List the titles of all movies directed by 'Hitchcock'.  
 (ii) Find the movie names where one or more actors acted in two or more movies.  
 (iii) List all actors who acted in a movie before 2000 and also in a movie after 2015(use JOIN operation).  
 (iv) Find the title of movies and number of stars for each movie that has at least one rating and find the highest number of stars that movie received. Sort the result by movie title.  
 (v) Update rating of all movies directed by 'RAJMOULI' to 5.

**Module-4**

7. a. Define normalization. Why normalization is important in designing databases. **04** (2 :4 : 2.7.1)
- b. List and explain informal design guidelines for relational databases. **08** (2 :4 : 3.7.1)
- c. Explain 1NF, 2NF, 3NF, BCNF with suitable example. **08** (2 :4 : 3.7.1)

**OR**

8. a. Write an algorithm to determine the closure of  $X^x$  under F. **04** (2 :4 : 2.7.1)
- b. What is functional dependency? Explain the inference rules for functional dependency with proof. **08** (2 :4 : 2.6.2)
- c. Given a relation R (A, B, C, D, E) and Functional Dependency set  $FD = \{AB \rightarrow C, D \rightarrow E\}$ , show whether the given R is in 3 NF? If not convert it into 3 NF. **08** (2 :4 : 3.7.1)

**Module-5**

9. a. Define transaction. List and explain ACID properties of transaction. **06** (2 :5 : 2.7.2)
- b. Explain state transition diagram of the typical states that transaction goes through during execution. **06** (2 :5 : 2.7.2)
- c. Discuss the problems arise due to interleaved execution. **08** (2 :5 : 2.7.1)

**OR**

- 10 a. Explain basic Timestamp Ordering algorithm for Concurrency Control. **06** (2 :5 : 1.6.1)
- b. Discuss lock table management in two phase locking concurrency control **08** (2 :5 : 2.7.2)
- c. Write a note on (i) Single user System (ii) Multiuser System **06** (2 :5 : 2.7.2)

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