Enrolment No/Seat No.: _____

R.N.G.PATEL INSTITUTE OF TECHNOLOGY-RNGPIT

(An Autonomous Institute U/s UGC Act 1956)

B.Tech. SEMESTER-III, SEMESTER END EXAMINATION – WINTER 2025

SUBJECT CODE: 1IT302 **DATE: 18-12-2025**

SUBJECT NAME: DATABASE MANAGEMENT SYSTEM

TIME: 11:00 AM to 01:30 PM **TOTAL MARKS: 70**

Instructions

1. It is **compulsory** for students to write **Enrolment No. /Seat No.** on the question paper.
2. Write answers of **Section A** and **Section B** in **separate answer books**.
3. Attempt all questions from both **Section A** and **Section B**.
4. Each section carries **35 marks**, with a total of **70 marks** for the examination.
5. The figures to the right of each question indicate full marks, make suitable assumptions with justification.
6. BL - Cognitive Level (As per Revised Bloom's Taxonomy) (R-Remember, U-Understanding, A –Application, N –Analyze, E – Evaluate, C -Create), CO - Course Outcomes.

SECTION A

			Marks	BL	CO
Q.1	**(a)**	List out any six applications of databases in real life.	**03**	**R**	**1**
	(b)	Explain Data Abstraction. How does it help in database design?	**04**	**U**	**1**
Q.2	**(a)**	Define the following terms: 1. Many-one Relationship 2. Participation Constraints 3. Entity	**03**	**R**	**2**
	(b)	Differentiate between disjoint and overlapping constraints in EER Model.	**04**	**U**	**2**
	(c)	Explain aggregation in the EER model with a real-life example.	**07**	**U**	**2**
		OR			
Q.2	**(a)**	Define relational algebra and list its basic operation.	**03**	**R**	**2**
	(b)	Differentiate between selection (σ) and projection (π).	**04**	**U**	**2**
	(c)	Explain the types of attributes in ER model with example.	**07**	**U**	**2**
Q.3	**(a)**	What is SQL? List out the different categories of SQL.	**03**	**R**	**3**
	(b)	Explain different types of keys in database with example.	**04**	**U**	**3**
	(c)	Consider following relations and write queries in the form of relational algebra. Accounts(acc_no, balance, bank_id, bank_name, city) 1) List all Acount Numbers in "HDFC" bank. 2) List all bank names in "Ahmedabad" city.	**07**	**A**	**3**

OR

			Marks	BL	CO
Q.3	**(a)**	Define JOIN. List different types of joins supported in SQL.	**03**	**R**	**3**
	(b)	Explain aggregate functions in SQL.	**04**	**U**	**3**
	(c)	Consider the following tables and answer the queries in SQL. Products(prod_id, prod_name, category, price) 1) List all the products having price less than 2000. 2) Update price of a product to 3000 whose product id is 3.	**07**	**A**	**3**

SECTION B

			Marks	BL	CO
Q.4	**(a)**	Apply a trigger to automatically insert an entry into an *Audit_Log* table whenever a record is deleted from the *Customer* table.	**03**	**A**	**4**
	(b)	Apply DAC to grant a user permission to view and update the *Employee* table but restrict them from deleting data.	**04**	**A**	**4**
Q.5	**(a)**	What is Closure of a Set of Functional Dependencies? Explain its importance.	**03**	**U**	**5**
	(b)	Differentiate BCNF and 3NF.	**04**	**U**	**5**
	(c)	Explain the steps involved in query processing with a neat diagram.	**07**	**U**	**5**

OR

Q.5	**(a)**	What is a non-trivial Functional Dependency? Explain with an example.	**03**	**U**	**5**
	(b)	Explain different measures of query cost.	**04**	**U**	**5**
	(c)	Explain the process of normalization from 1NF to 3NF with suitable examples.	**07**	**U**	**5**
Q.6	**(a)**	List and explain the properties of transaction.	**03**	**U**	**6**
	(b)	Explain conflict serializability with an example.	**04**	**U**	**6**
	(c)	Explain the working of the Two-Phase Commit protocol in transaction management with a neat diagram	**07**	**U**	**6**

OR

Q.6	**(a)**	Explain how checkpoints help in the recovery process.	**03**	**U**	**6**
	(b)	Compare two-phase locking (2PL) and strict two-phase locking protocols.	**04**	**U**	**6**
	(c)	Draw and explain the state transition diagram of a transaction in DBMS.	**07**	**U**	**6**

****