

R.N.G.PATEL INSTITUTE OF TECHNOLOGY-RNGPIT
(An Autonomous College U/s UGC Act 1956)

B. Voc. SEMESTER-I, SEMESTER END EXAMINATION - WINTER 2024

Subject Code: 1SD101

Date: 17-12-2024

Subject Name: DATABASE MANAGEMENT SYSTEM

Time: 11:00 AM to 01:00 PM

Total Marks: 50

Instructions

1. It is **compulsory** for students to write **Enrolment No. /Seat No.** on the question paper.
2. Attempt all questions in the question paper.
3. The figures to the right of each question indicate full marks. Make suitable assumptions with proper justification wherever required.
4. Simple, non-programmable scientific calculators are permitted.
5. BL - Bloom's Taxonomy Levels (R-Remember, U-Understanding, A-Application, N-Analyze, E-Evaluate, C-Create), CO - Course Outcomes.

Marks BL CO

Q.1 Objective-Type Questions

[05]

- | | |
|--|---------------------------|
| <p>(a) What is the primary goal of query optimization in a relational database system?</p> <p style="margin-left: 20px;"> (i) Minimize memory usage (ii) Maximize query execution time
 (iii) Minimize query execution time (iv) Maximize disk I/O </p> | <p>1 R 5</p> |
| <p>(b) In relational algebra, what does the selection operation (σ) do?</p> <p style="margin-left: 20px;"> (i) Combines two relations based on a common attribute (ii) Selects tuples that satisfy a given condition
 (iii) Orders tuples according to a specified criterion (iv) Filters attributes of a relation </p> | <p>1 R 5</p> |
| <p>(c) Which of the following algorithms is commonly used for sorting data in relational query processing?</p> <p style="margin-left: 20px;"> (i) Merge Sort (ii) Quick Sort
 (iii) Bubble Sort (iv) Both (i) and (ii) </p> | <p>1 R 5</p> |
| <p>(d) In a query evaluation plan, which structure represents the order in which operations are executed?</p> <p style="margin-left: 20px;"> (i) Query execution tree (ii) Relational schema
 (iii) Query optimization graph (iv) Query plan graph </p> | <p>1 R 5</p> |
| <p>(e) Given a relational algebra expression, which approach is commonly used for evaluating the expression?</p> <p style="margin-left: 20px;"> (i) Left-to-right evaluation (ii) Using a specific execution plan
 (iii) Top-down traversal (iv) Using natural join only </p> | <p>1 R 5</p> |

Q.2 Attempt Any Three	[15]		
(a) Explain the ACID properties of transactions.	5	U	4
(b) Describe Join Operation in Query Processor.	5	U	4
(c) Discuss Deadlock in details. How to detect deadlock?	5	A	4
(d) Write a PL/SQL block to print if the given number is odd or even.	5	A	3

Q.3 Attempt Any Three	[15]		
(a) Explain Characteristics of DBMS	5	U	1
(b) Draw and Explain Three Level ANSI SPARC Database System.	5	U	1
(c) List the type of joins in relational algebra. Explain with examples.	5	R	3
(d) The relational database schema is given below. employee (person-name, street, city) works (person-name, company-name, salary) company (company-name, city) manages (person-name, manager-name) Write the relational algebra expressions for the given queries.	5	A	3
1. Find the names of all employees who work for First Bank Corporation.			
2. Find the names and cities of residence of all employees who work for First Bank Corporation.			
3. Find the names, street address, and cities of residence of all employees who work for First Bank Corporation and earn more than \$10,000 per annum.			
4. Find the names of all employees in this database who do not work for First Bank Corporation.			

Q.4 Attempt Any Three	[15]		
(a) Discuss Mapping Cardinality of ER-Diagram.	5	A	2
(b) Define normalization? List type of it. Explain 1NF with example.	5	A	2
(c) Explain type of Decomposition with example.	5	U	2
(d) List any five constrains. Explain any two with example.	5	A	3