

Supplementary Summer Examination – 2024

Course: B. Tech. Branch : Computer Engineering/Computer Science and Engineering

Subject Code & Name: Database Systems (BTCOC501)

Semester :V

Max Marks: 60

Date:01/07/2024

Duration: 3 Hr.

**Instructions to the Students:**

1. All the questions are compulsory.
2. The level of question/expected answer as per OBE or the Course Outcome (CO) on which the question is based is mentioned in ( ) in front of the question.
3. Use of non-programmable scientific calculators is allowed.
4. Assume suitable data wherever necessary and mention it clearly.

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | (Level/CO) | Marks     |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-----------|
| <b>Q. 1 Solve Any Two of the following.</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |            | <b>12</b> |
| A) Draw and explain the detailed system architecture of DBMS.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Understand | 6         |
| B) Explain in detail about various key constraints used in database system.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Understand | 6         |
| C) Discuss the main characteristics of the database approach and specify how it differs from traditional file system?                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Analysis   | 6         |
| <b>Q.2 Solve Any Two of the following.</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            | <b>12</b> |
| A) Write a short notes on<br>i) Foreign Key ii) Relation state iii) Database schema.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Understand | 6         |
| B) account(account_number, branch_name, balance)<br>branch (branch_name, branch_city, assets)<br>customer (customer_name ,customer_street, customer_city)<br>loan (loan_number, branch_name, amount)<br>depositor((customer_name, account_number)<br>borrower(customer_name, loan_number)<br>Write the following queries in SQL:<br>1)For all customers who have a loan from the bank, find their names, loan numbers, and loan amount.<br>2) Find the customer names, loan numbers, and loan amounts, for all loans at the Panvel branch.<br>3)Find the names of all branches that have assets greater than those of at least one branch located in Mumbai.<br>4)Find the average account balance of those branches where the account balance is greater than Rs. 1500.<br>5) Find the maximum across all branches of the total balance at each branch. | Apply      | 6         |
| C) Write the SQL syntax for the following with example:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Understand | 6         |

1)SELECT    2) ALTER    3)UPDATE

|             |                                                                                        |                   |           |
|-------------|----------------------------------------------------------------------------------------|-------------------|-----------|
| <b>Q. 3</b> | <b>Solve Any Two of the following.</b>                                                 |                   | <b>12</b> |
| <b>A)</b>   | <b>Write an SQL query for the following:</b>                                           | <b>Apply</b>      | <b>6</b>  |
|             | a)To create a table of Hospital database with minimum 4 fields                         |                   |           |
|             | b) To insert two records                                                               |                   |           |
|             | c) To add new field                                                                    |                   |           |
|             | d)To display all records                                                               |                   |           |
| <b>B)</b>   | <b>What are JOINS? Explain INNER JOIN and OUTER JOIN.</b>                              | <b>Understand</b> | <b>6</b>  |
| <b>C)</b>   | <b>Explain different types of trigger.</b>                                             | <b>Understand</b> | <b>6</b>  |
| <b>Q.4</b>  | <b>Solve Any Two of the following.</b>                                                 |                   | <b>12</b> |
| <b>A)</b>   | <b>State BCNF. How does it differ from 3NF?</b>                                        | <b>Analysis</b>   | <b>6</b>  |
| <b>B)</b>   | <b>Explain about dynamic multilevel indexing using B+ trees.</b>                       | <b>Understand</b> | <b>6</b>  |
| <b>C)</b>   | <b>Define Multi-valued dependency. Explain the Fourth normal form with an example.</b> | <b>Understand</b> | <b>6</b>  |
| <b>Q. 5</b> | <b>Solve Any Two of the following.</b>                                                 |                   | <b>12</b> |
| <b>A)</b>   | <b>Explain in detail about timestamp based concurrency control techniques.</b>         | <b>Understand</b> | <b>6</b>  |
| <b>B)</b>   | <b>Explain ACID properties of a transaction.</b>                                       | <b>Understand</b> | <b>6</b>  |
| <b>C)</b>   | <b>Explain how Concurrency control can be achieved with locking methods?</b>           | <b>Understand</b> | <b>6</b>  |

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