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P.E.S. College of Engineering, Mandya - 571 401
(An Autonomous Institution affiliated to VTU, Belagavi)
Fifth Semester, B.E. - Computer Science and Engineering
Semester End Examination; Dec - 2019
Database Management System

Time: 3 hrs   *Max. Marks: 100*

Note: Answer **FIVE** full questions, selecting **ONE** full question from each unit.

UNIT - I

1 a. With a neat diagram, explain "Three schema Architecture".	8
b. Explain the advantages of using DBMS approach.	8
c. Define the following Terms:	
i) Schema ii) Data model	4
iii) Meta data iv) Program data independence	
2 a. Explain the different types of attributes that occur in ER-model.	8
b. Write an ER diagram of hospital management system. Assume your own entities (minimum 4), attributes and relations and participation, constraints and cardinality ratio.	8
c. With respect to ER model, explain the following with example:	
i) Strong entity ii) Complex attribute	4

UNIT - II

3 a. Explain entity integrity and referential integrity constraints. Why each is considered important?	6
b. Discuss the following relational algebra operations. Illustrate with an example;	
i) PROJECT ii) DIFFERENCE	8
c. Briefly discuss about the Natural Join and Equi Join operations.	6
4 a. Discuss design of relation database using ER-to-Relational mapping.	10
b. With examples, explain different set operations in relational algebra.	10

UNIT - III

5 a. What is a view? Explain how to create a view and how view can be dropped?	6
b. Consider the following employee database:	

Employee(<u>emp_name</u>, street, city)
Works (<u>emp_name</u>, company_name, salary)
Company (company_name, city)
Manager (emp_name, manager_name)
Write SQL queries for the following:

   i) Find all employees in the database who live in the same cities as the companies for which they work

   ii) Find all employees who earn more than the average salary of all employees of their company

   iii) Give all managers of SBM a 10% raise

   iv) Find the company that has smallest payroll

8

c. Explain Exists and Unique functions in SQL with example. 6

6 a. How are triggers and assertions defined in SQL? Explain. 8

b. Explain INSERT, DELETE and UPDATE statements in SQL with example. 12

UNIT - IV

7 a. What is the need for normalization? Explain first, second and third normal forms with example for each. 12

b. Define BCNF. How does it differ from 3NF? Why is it considered a stronger than 3NF? 8

8 a. Explain multi-valued dependency and fourth normal form with an example. 10

b. Discuss join dependencies and fifth normal form. 10

UNIT - V

9 a. Explain the desirable properties of transaction with an example. 10

b. Discuss concurrency control based on timestamp ordering. 10

10 a. What is data fragmentation? Discuss different types of data fragmentation and significance of replication of data. 10

b. Discuss Query processing and optimization in distributed databases. 10

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