



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 – 2017/Jan - 2018

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. Discuss the main categories of data models. 7
- b. Explain the different types of user friendly interfaces provided by a DBMS. 7
- c. Define the following terms with example: 6
- i) Derived Attributes ii) Role Names iii) Strong Entity.
- 2 a. Write an ER diagram for an Airline Reservation System. Assume your own entities (Minimum four), attributes and relations. Mention the cardinality ratios. 8
- b. Define the following terms with examples: 8
- i) Participation constraints ii) Recursive relationships.
- c. Explain degree of a relationship Type. 4

UNIT - II

- 3 a. Define the following terms with respect to the relational model of data: 6
- i) A relation schema ii) A relation state iii) Candidate key.
- b. Show an example of a violation of the integrity constraint in Insert operation on a relation. 6
- c. Discuss the following Relational Algebra operations from set theory: 8
- i) Union ii) Intersection.
- 4 a. Explain the Equi join and Natural join operations with an example. 10
- b. Discuss the Division Operation. How it represented and what are the requirements of the numerator and denominators relations? Explain with an example. 10

UNIT - III

- 5 a. Consider the following relational database schema for a LIBRARY database: 8
- BOOK(Book_Id, Title, Publisher_name)
- BOOK_COPIES (Book_Id, Branch_Id, Number_of_Copies)
- BOOK_LOANS(Book_Id, Branch_Id, Card_No, Date_out, Due_date)
- LIBRARY_BRANCH (Branch_ID, Branch_Name, Address)
- BORROWER (Card_No, Name, Address, Phone)

Write SQL queries for the following:

- i) How many copies of the book titled ‘The lost Tribe’ are owned by the library branch whose name is ‘Sharptown’?
- ii) Retrieve the names of all borrowers who do not have any books checked out.
- iii) For each library branch, retrieve the branch name and the total number of books loaned out from the that branch

- b. Write a note on Aggregate functions in SQL with examples. 12
- 6 a. Explain the GROUP BY and HAVING clauses with examples. 6
- b. What are views? Explain the specification of views in SQL. 6
- c. With respect to SQL, explain the following with example: 8
 - i) The ALTER command
 - ii) The DROP command.

UNIT - IV

- 7 a. Explain 3NF and BCNF with appropriate examples. Prove BCNF is stronger than 3NF. 12
- b. What is a functional dependency (FD)? Explain why certain FD are called as trivial FDs. 8
- 8 a. List and explain Informal design guidelines for a relational schema design. 10
- b. Explain fourth normal form (4NF). When is it violated? 10

UNIT - V

- 9 a. Explain the desirable properties of a transactions. 6
- b. Explain the different types of failures. 6
- c. Explain the following variants of the two-phase locking protocols: 8
 - i) conservative
 - ii) Strict.
- 10 a. What is a time stamp? How does the system generate timestamp. 6
- b. Briefly explain the advantages of distributed databases. 6
- c. What is a schedule? Define the concepts of recoverable and cascades schedules. 8

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