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P.E.S. College of Engineering, Mandya - 571 401

(An Autonomous Institution affiliated to VTU, Belgaum)

Fifth Semester, B.E. - Computer Science and Engineering

Semester End Examination; Dec. - 2015

Data Base Management System

Time: 3 hrs *Max. Marks: 100*

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

UNIT - I

1 a. Explain the advantages of using DBMS. 8

b. With diagram describe 3-schema architecture. Why do we need mappings between schema levels? 8

c. Give an example for ternary relationship and explain. 4

2 a. Write an ER diagram for a library system of a college. Identify at least five entities, relevant attributes and relationship types. Also construct relational schema from the ER-diagram. 10

b. Explain the following with an example:

i) Weak and strong entity.

ii) Single and multi valued attributes.

iii) Primary and foreign key. 10

UNIT - II

3 a. Explain UPDATE operation on relations and the types of constraints that must be checked for each UPDATE operation. 8

b. Explain the different types of JOIN operations. 7

c. Give examples for key constraint and referential integrity constraints and explain. 5

4 a. Consider the following relations for a database that keeps track of student enrollment in courses and the books adopted per each course:

STUDENT (USN, Name, Address)

COURSE (Course #, Cname, Dept)

ENROLL (USN, Course #, Grade)

INSTRUCTOR (inst-id, inst-name, course #)

Specify the following queries in relational algebra: 9

i) List the name of all students who have enrolled for the course "XYZ".

ii) List the name of all students who have got grade "S" and "A" in course "XYZ".

iii) Name the instructor who has handled the course named "XYZ".

b. Explain the relational data base design using ER – to – Relational mapping in detail. 11

Contd…2

UNIT - III

5 a. Explain the different constraints used in SQL statements. Give examples. 10

b. Consider the following relations for a data base that keep track of business trip of a salesperson on a sales office,

S-person (SSN, name, start_year, dept_No.)

Trip (SSN, from_city, to_city, dept_date, relation_date, trip_id)

Expense (trip_id, account no, amount)

Write queries in SQL, 10

i) Give the details (all attributes of trip) for trips that exceed Rs. 50,000/-

ii) Print name of salesman who had trip to Delhi.

iii) Print the total trip expenses incurred by the salesman with SSN = "123".

iv) List the salesman who travelled from location 'X' to location 'Y'

6 a. Explain the following with examples:

i) EXISTS function ii) UNIQUE function 12

iii) GROUP by clause iv) HAVING clause.

b. Explain the concept of VIEW in SQL with example. 8

UNIT - IV

7 a. Explain the informal design guidelines for relation schemas. 12

b. Write the algorithm for finding a minimal cover F for a set of functional dependencies E. Given a set of FDs E : {B $\rightarrow$A, D$\rightarrow$A, AB$\rightarrow$D} find the minimal cover E. 8

8 a. Explain 2NF and 3NF with examples Highlight difference between 3NF and Boyce – Code NF. 10

b. Explain multi valued dependency and 4NF with example. 10

UNIT - V

9 a. Explain 2-phase locking techniques for concurrency control. 12

b. Explain the desirable properties of transaction, with justifications. 8

10a. Explain the recovery techniques based on immediate update. 10

b. Describe the tree phases of ARIES recovery method. 10

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