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

(An Autonomous Institution affiliated to VTU, Belgaum)

Second Semester, Master of Computer Applications (MCA)

Semester End Examination; June/July - 2015

Database Management Systems

Time: 3 hrs   *Max. Marks: 100*

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

Unit - I

1. a.	Briefly discuss the advantages of using the DBMS.	10
b.	What are the different types of database end users? Discuss the main objectives of each?	6
c.	What is data redundancy? What are the disadvantages of having redundancy within a database?	4
2 a.	Explain the component –modules of DBMS and their interactions with the help of a diagram.	10
b.	Explain with three-tier client/server architecture. Where it is used?	6
c.	What are the different ways of classifying a DBMS?	4

Unit - II

3 a.	Discuss the role of a high level data model in the database design process.	10
b.	Define the following terms: (i) Entity (ii) Relationship instance (iii) complex attribute (iv) Value set (v) Key attribute	10
4 a.	Construct an ER diagram for BANK database. Each bank have multiple branches, each branch can have multiple accounts and loans. Identify proper entities & relationship among entity.	10
b.	Explain the difference between an attribute and a value set.	4
c.	Define the following with an example: (i) Cardinality Ratio (ii) Ternary relationship	6

Unit -III

5 a. Consider the following two tables T_1 and T_2. Show the results of the following operations.

i) $T_1 \bowtie_{T1.p = T2.A} T_2$ ii) $T_1 \bowtie_{.Q = T2.B} T_2$

iii) $T_1 \bowtie_{T1.p = T2.A} T_2$ iv) $T_1 \cup T_2$

(Assume T_1 and T_2 are union compatible)

Table T_1		
P	Q	R
10	a	5
15	b	8
25	a	6

Table T_2		
A	B	C
10	b	6
25	c	3
10	b	5

10

  b. Outline the steps to convert the basic ER model to relational database schema.   10

6. a. Explain the following relational algebra operations with suitable example :   10

    (i) Select   (ii) Project   (iii) rename   (iv) full outer join.

  b. Briefly discuss the different types of update operations on relational database. Show an example of a violation of the referential integrity in each of the update operation.   10

Unit - IV

7 a. Explain the syntax of a "select" statement in SQL. Write the SQL query for the following relational algebra expression.   6

    *Bdate, Address (σ Fname = 'John' AND M init = 'B' AND

    Lname = 'smith' (EMPLOYEE))

  b. Write a drop and alter command with suitable example.   4

  c. What is embedded SQL? With an example, illustrate how you would connect to a database, fetch records and display. Also explain the concept of stored procedure in brief.   10

8 a. Write a note an aggregation functions in SQL with example.   10

  b. Consider the following relations.

    Production (Pname, address)

    movie (mid, title, yearsofrelease, length, genre, plot outline, pname)

    actor (aid, aname, dob)

    director (did, dname, dob)

    actsin (aid, mid), role)

    directedby (did, mid)   10

      i) List the details of horror movies released in 2012 and directed by more than 2 directors.

      ii) List the details of production companies producing maximum movies.

      iii) List the details of movies where director and actor have same dob.

      iv) List the details of actors who acted in movies having same titles but released before 2000 and after 2010.

Unit - V

9 a. Explain multivalued dependency and fourth normal form with an example.   10

  b. Which normal form is based on the concept of transitive fundamental dependency? Explain with an example the decomposition into 3NF.   10

10 a. Explain the problems that can occur when concurrent transactions are executed. Give example.   10

  b. Briefly discuss the two phase locking protocol used in concurrency control.   10

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