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Fifth Semester B.E. Degree Examination, June 2012

Database Management Systems

Time: 3 hrs.

Max. Marks:100

Note: Answer FIVE full questions, selecting at least TWO questions from each part.

PART – A

- 1 a. Discuss the main characteristics of the database approach. How does it differ from traditional file systems? (10 Marks)
- b. Explain the component modules of DBMS and their interaction, with the help of a diagram. (10 Marks)
- 2 a. With a diagram, describe the three schema architecture of database systems. (04 Marks)
- b. Discuss with examples, different types of attributes. (06 Marks)
- c. Design an ER diagram for keeping track of information about a hospital database taking into account atleast four entities. (10 Marks)

- 3 a. Consider the following two tables T_1 and T_2 . Show the results of the following operations. (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

$$\text{i) } T_1 \bowtie_{T_1 \cdot P = T_2 \cdot A} T_2$$

$$\text{ii) } T_1 \bowtie_{T_1 \cdot P = T_2 \cdot A} T_2$$

$$\text{iii) } T_1 \bowtie_{T_1 \cdot P = T_2 \cdot A \text{ AND } T_1 \cdot R = T_2 \cdot C} T_2$$

$$\text{iv) } T_1 \cup T_2$$

$$\text{v) } T_1 \bowtie_{T_1 \cdot Q = T_2 \cdot B} T_2$$

(10 Marks)

- b. Give the ER to relational mapping algorithm. Discuss each step, with an example. (10 Marks)
- 4 a. Consider the following schema :
 SAILORS (sid, sname, rating, age)
 BOATS (bid, bname, color)
 RESERVES (sid, bid, day)
 Write the queries in relational algebra to :
 - i) Find the names of sailors who have reserved boat number '103'.
 - ii) Find the names of sailors who have reserved a 'red' and a 'green' boat.
 - iii) Find the names of sailors who have reserved at least one boat.
 - iv) Find the names of sailors with age over 20 years, who have not reserved a red boat.
- b. Explain IN and EXISTS operators of SQL with suitable examples. (12 Marks)

(08 Marks)

PART – B

- 5 a. How is a 'view' created and dropped? What are the problems associated with updation of views? (10 Marks)
b. What is embedded SQL? With an example, illustrate how would you connect to a database, fetch records and display. Also explain the concept of stored procedure, in brief. (10 Marks)
- 6 a. What is a functional dependency? Write an algorithm to find the minimal cover for a set of functional dependencies. (10 Marks)
b. Why normalization is required? Explain the first, second and third normal forms with an example. (10 Marks)
- 7 a. Explain multivalued dependency and fourth normal form, with an example. (10 Marks)
b. What are ACID properties? Explain. (06 Marks)
c. Write and explain two phase locking protocol. (04 Marks)
- 8 a. What is write-ahead logging? What is forced to disk at the time a transaction commits? (06 Marks)
b. Write and explain time stamp based ordering algorithm. (08 Marks)
c. Write a note on check pointing. (06 Marks)

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