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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).

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

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

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

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

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

$$iv) T_1 \cup T_2$$

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

(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.

(12 Marks)

- b. Explain IN and EXISTS operators of SQL with suitable examples.

(08 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
 2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

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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