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06CS54

Fifth Semester B.E. Degree Examination, December 2010

Database Management Systems

Time: 3 hrs.

Max. Marks:100

Note: Answer any 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? (08 Marks)
- b. Explain the difference between logical and physical data independence. (04 Marks)
- c. Explain the operation of two – tier client/server architecture for RDBMS. (08 Marks)

- 2 a. Design an ER – diagram for keeping track of information about bank database, taking into account at least 4 entities. (10 Marks)
- b. Describe how to map the following scenarios in ER – model to schema, with suitable examples : i) Strong entity ; ii) One – to – one relationship. (10 Marks)

- 3 a. List the characteristics of relation. Discuss each one. (05 Marks)
- b. Discuss various types of inner join operations. (06 Marks)
- c. Consider the following schema –
 Sailors (sal – ID, sal – name, rating, age)
 Reserves (sal – ID, boat – ID, day)
 Boats (boat – ID, boat – name, color).
 Using the above schema solve the queries in relational algebra.
 i) Find the names of sailors, who have reserved all boats, called Interlake.
 ii) Find the sids of sailors, with age over 20, who have not reserved a red boat.
 iii) Find the names of sailors, who have reserved at least two boats. (09 Marks)

- 4 a. Explain how the GROUP by clause works. What is the difference between the WHERE and HAVING clause? (04 Marks)
- b. How does SQL implement the entity integrity constraints of the relational data model? Explain with an example. (04 Marks)
- c. Using the same tables given in Q.No.3(c), write SQL queries to :
 i) Find all sailors ID of sailors who have a rating of 10 or reserved the boat 105.
 ii) Find sailors whose rating is better than a sailor called “RAJ”.
 iii) Find the names of sailors who are older than the oldest sailor with a rating of 10. (12 Marks)

PART – B

- 5 a. List the approaches to DB programming. What are the main issues involved in DB programming? (08 Marks)
- b. What is the impedance mismatch problem? Which of the three programming approaches minimizes this problem? (06 Marks)

- c. How are triggers and assertions defined in SQL? Explain. (06 Marks)
- 6 a. Explain any two informal quality measures employed for a relational schema design. (06 Marks)
- b. Consider the following relations : CAR – SALE (car – no, date – sold, salesman – no, commission %, discount). Assume a car can be sold by multiple salesmen and hence primary key is {car – no, salesman – no}.
Additional dependencies are :
Date – sold → Discount and
Salesman – no → Commission %.
- i) Is this relation in 1NF, 2NF or 3NF? Why or why not? (10 Marks)
- ii) How would you normalize this completely? (04 Marks)
- c. Discuss the minimal sets of functional dependencies. (04 Marks)
- 7 a. What are the ACID properties? Explain each one. (06 Marks)
- b. What is serializability? How can serializability be ensured? Do you need to restrict concurrent execution of transaction to ensure serializability? Justify your answer. (10 Marks)
- c. What is the phantom problem? Explain with an example. (04 Marks)
- 8 Write short notes on : (20 Marks)
- 2PL protocol
 - Deadlocks
 - Aries
 - Multivalued dependency.
