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Printed Pages : 4 **TEE-11**

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 0203 Roll No.

B. Tech.

(SEM. VII) EXAMINATION, 2007-08

DATA BASE MANAGEMENT SYSTEM, DATA MINING AND WAREHOUSING

Time : 3 Hours] *[Total Marks : 100*

Note : *(1) Attempt **all** questions.*

*(2) **All** questions carry **equal** marks.*

(3) Be precise in your answer.

*(4) No **second** answer book will be provided.*

1 Attempt any **four** parts of the following : 4×5

(a) What are the five main functions of a database administrator?

(b) List six major steps that you would take in setting up a database for a particular enterprise.

(c) Construct an ER diagram for a car-insurance company whose customers own one or more cars each. Each car has associated with its zero to any number of recorded accidents.

(d) Explain the distinction between condition-defined and user-defined constraints. Which of these constraints can the system check automatically? Explain your answer.

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(e) An E-R diagram can be viewed as a graph. What do the following mean in terms of the structure of an enterprise schema?

(i) The graph is disconnected

(ii) The graph is acyclic.

(f) We can convert any weak entity set to a strong entity set by simply adding appropriate attributes. Why, then, do we have weak entity sets?

2 Attempt any **four** parts of the following : 4×5

(a) Design a relational database for a university Registrar's office. The office maintains data about each class, including the instructor, the number of students enrolled, and the time and place of the class meetings. For each student-class pair, a grade is recorded.

(b) List two reasons why null values might be introduced into the database.

(c) Suppose there are two relations r and s, such that the foreign key B of r references the primary key A of s. Describe how the trigger mechanism can be used to implement the ON DELETE CASCADE option.

(d) Write an SQL query, without using a 'with' clause, to find all branches where the total account deposit is less than the average total account deposit at all branches, using a nested query in the 'from' clauser.

(e) Describe the circumstances in which you would choose to use embedded SQL rather than SQL alone or only a general-purpose programming language.

(f) What are certain functional dependencies called trivial functional dependencies? – Explain.

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3 Attempt any **two** parts of the following : 2×10

(a) (i) Explain what is meant by "repetition of information" and "inability to represent information". Explain why each of these properties may indicate a bad relational database design.

(ii) Suppose that we decompose the schema R = (A, B, C, D, E) into

(A, B, C)

(A, D, E).

Show that this decomposition is a lossless-join decomposition if the following set F of functional dependencies holds :

$A \rightarrow BC$

$CD \rightarrow E$

$B \rightarrow D$

$E \rightarrow A$

(b) Given the database schema R (a,b,c), and a relation r on the schema R, write an SQL query to test whether the functional dependency $b \rightarrow c$ holds on relation r. Also write an SQL assertion that enforces the functional dependency. Assume that no null values are present.

(c) Use Armstrong's axioms to prove the soundness of the decomposition rule.

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4 Attempt any **two** parts of the following : 2×10

(a) List the ACID properties. Explain the usefulness of each. Why should database implementors paid more attention to the ACID properties?

(b) What is a recoverable schedule? Why is recoverability of schedules desirable? Are there any circumstances under which it would be desirable to allow nonrecoverable schedules? Explain your answer.

(c) (i) What is a data warehouse? How does it differ from a database?

(ii) Describe the main functions of the following components of a data warehouse :

(a) Load manager

(b) Warehouse manager

(c) Query manager

(d) Meta data.

5 Attempt any **two** parts of the following : 2×10

(a) What do you mean by two-phase locking? What benefit is provided by rigorous two-phase locking? How does it compare with other forms of two-phase locking?

(b) What is timestamp? Describe the basic time stamp ordering protocol for concurrency control.

(c) Explain the following :

(i) Multiple Granularity

(ii) Multiversion Two-phase Locking.

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