C 80826

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SIXTH SEMESTER B.TECH. (09 SCHEME) (ENGINEERING) DEGREE EXAMINATION, APRIL 2015

IT/CS/PTCS 09 604—DATABASE MANAGEMENT SYSTEMS

Time : Three Hours

Maximum : 70 Marks

Part A

Answer all questions.

1. List the advantages of using DBMS.

2. What is meant by data independence ?

3. Differentiate between static file and dynamic file.

4. What is meant by the closure of a set of functional dependencies ?

5. What is the difference between the constrained write and the unconstrained write assumptions ?

(5 × 2 = 10 marks)

Part B

Answer any four questions.

6. Explain the difference between specialization and generalization with example.

7. Describe the two alternatives for specifying structural constraints on relationship types. What are the advantages and disadvantages of each ?

8. Discuss the advantages and disadvantages of using :

    (a) an unordered file ;

    (b) an ordered file ; and

    (c) a static hash file with buckets and chaining.

    Which operations can be performed efficiently on each of these organizations, and which operations are expensive ?

9. Define Boyce-Codd normal form. How does it differ from 3NF ? Why is it considered a stronger form of 3NF ?

10. Discuss how serializability is used to enforce concurrency control in a database system. Why is serializability sometimes considered too restrictive as a measure of correctness for schedules ?

11. Write about the locking techniques.

(4 × 5 = 20 marks)

Turn over

Part C

12. (a) A database is being constructed to keep track of the teams and games of a sports league. A team has a number of players, not all of whom participate in each game. It is desired to keep track of the players participating in each game for each team, the positions they played in that game, and the result of the game. Try to design an ER schema diagram for this application, stating any assumptions that are to be made. Any favourite sport (soccer. baseball, football...) can be chosen.

Or

(b) Identify all the important concepts represented in the library database case study described below. In particular, identify the abstractions of classification (entity types and relationship types), aggregation, identification, and specialization/generalization. Specify (min, max) cardinality constraints, whenever possible. List details that will impact eventual design, but have no bearing on the conceptual design. List the semantic constraints separately. Draw an EER diagram of the library database.

13. (a) Write the pseudo code for the insertion algorithms for linear hashing and for extendible hashing.

Or

(b) Explain with examples about the working of B-trees and B + trees.

14. (a) Illustrate how the process of creating first normal form relations may lead to multivalued dependencies. How should the first normalization be done properly so that MVDs are avoided ?

Or

(b) How is a query executed in SQL ? With appropriate examples, explain the insert, delete and update statements in SQL.

15. (a) Prove that the wait-die and wound-wait protocols avoid deadlock and starvation.

Or

(b) Write in detail about database security and authorization.

$(4 \times 10 = 40 \text{ marks})$