B.E/B.TECH DEGREE EXAMINATIONS: APRIL /MAY 2012

Fourth Semester

ITY103: DATABASE MANAGEMENT SYSTEMS

(Common to Computer Science and Engineering & Information Technology)

Time: Three Hours   **Maximum Marks: 100**

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1. Which of the following statement is true?

   (i) Internal schema describes the physical storage structures of the database.

   (ii) Conceptual schema describes the parts of the database that a particular user group is interested.

   (iii) External schema describes the structure of the whole database.

   a. (i) only   b. (ii) only   c. (i) and (ii)   d. (ii) and (iii)

2. A collection of conceptual tools for describing data, data relationships data semantics and constraints is called _____.

   a. Data model   b. Relational algebra   c. Database   d.Catalog

3. Tuple relational calculus is _____.

   a. Procedural language   b. Non-Procedural Language

   c. Object- oriented   d. Object relational

4. Given the relation schema Bank(BankID, AccountNumb, Balance, Customer) with FDs:

   {BankID,AccountNumb -> Balance; BankID,AccountNumb -> Customer;   Customer -> BankID}.

   What is the highest normal form for the relation schema Bank?

   a. first   b. second   c. third   d. Boyce Codd

5. Which indexing scheme has an entry for each search key?

   a. Dense   b. Sparse   c. hash   d. Multilevel

6. Which of the following is a dynamic hashing technique?

   a. Extensible hashing   b. Open hashing   c. Secondary hashing   d. Closed hashing

7. Which component of database system ensures durability property?

   a. Transaction Management component   b. Recovery management component

   c. Concurrency control manager   d. File manager

8. Which of the following is a log based recovery mechanism?

    a. Immediate database modification   b. Locking protocols

    c. Shadow paging   d. Timestamp based protocols

9. Transparent DBMS

  a. Cannot hide sensitive information from users

  b. keeps its logical structure hidden from users

  c. keeps its physical structure hidden from users

  d. both b and c

10. A heterogeneous distributed database is which of the following?

  a. The same DBMS is used at each location and data are not distributed across all nodes.

  b. The same DBMS is used at each location and data are distributed across all nodes.

  c. A different DBMS is used at each location and data are not distributed across all nodes.

  d. A different DBMS is used at each location and data are distributed across all nodes.

PART B (10 x 2 = 20 Marks)

11. List out the responsibilities of DBA.

12. What are strong and weak entities? How they are represented in ER diagram?

13. How does the domain relational calculus differ from tuple relational calculus?

14. State the reasons why null values are used in relational database design.

15. Distinguish between dense index and sparse index.

16. How does multilevel indexing improves the efficiency of searching an index file?

17. State the advantages of concurrent execution of transactions.

18. What is conflict Serializability?

19. What are object oriented data bases? List out its characteristics.

20. Distinguish between homogenous and heterogeneous databases.

PART C (5 x 14 = 70 Marks)

21. a) (i) Listout the significant differences between a file processing system and a database system.   (7)

    (ii) Explain the 3 schema Architecture of database systems.   (7)

(OR)

  b) (i) Explain any four Relational Algebra operations with examples.   (8)

(ii) Construct an ER diagram for a hospital with a set of patients and a set of medical doctors. Associate each patient a copy of the various tests and examinations conducted. (6)

22. a) (i) What is Normalization? Explain 2NF and3NF in detail. (10)

 (ii) Define BCNF.How does it differ from 3NF? (4)

(OR)

 b) (i) Discuss the various pitfalls in a relational database design using a sample database. (10)

 (ii) Explain various integrity constraints with suitable examples. (4)

23. a) (i) Explain the various RAID organization and its levels. (10)

 (ii) With a neat sketch explain the storage structures. (4)

(OR)

 b) (i) What is a query? Discuss the steps involved in query processing. (6)

 (ii) Explain the various hashing techniques in detail. (8)

24. a) (i) What are the different types of locks? Explain the two phase locking for concurrency control in detail. (7)

 (ii) List the ACID properties of a transaction. Explain the usefulness of each. (7)

(OR)

 b) (i) Explain the shadow paging recovery scheme and discuss its advantages and disadvantages compared to log based recovery scheme. (7)

 (ii) What is deadlock? Explain the different techniques used to recover from deadlock? (7)

25. a) (i) Explain in detail the various distributed data storage mechanisms. (7)

 (ii) Explain how the following differ: fragmentation transparency, replication transparency and location transparency. (7)

(OR)

 b) (i) Explain the main concepts of Object oriented data model. (7)

 (ii) Discuss the relative advantages and disadvantages of centralized and distributed databases. (7)

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