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**Question Paper Code : 10267**

B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2012.

Fourth Semester

Computer Science and Engineering

CS 2255/141405/CS 46/CS 1254/10144 CS 406/080250009 – DATABASE  
MANAGEMENT SYSTEMS

(Common to Information Technology)

(Regulation 2008)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. List four significant differences between a file-processing system and a DBMS.
2. What are the different types of Data Models?
3. Describe a circumstance in which you would choose to use embedded SQL rather than using SQL alone.
4. List two major problems with processing of update operations expressed in terms of views.
5. Give an example of a relation schema R and a set of dependencies such that R is in BCNF, but not in 4NF
6. Why are certain functional dependencies called as trivial functional dependencies?
7. List down the SQL facilities for concurrency.
8. What benefit does strict two-phase locking provide? What disadvantages result?
9. Mention the different Hashing techniques.
10. When is it preferable to use a dense index rather than a sparse index? Explain your answer.



## PART B — (5 × 16 = 80 marks)

11. (a) Discuss in detail about database system architecture with neat diagram.

Or

- (b) Draw an E-R diagram for a banking enterprise with almost all components and explain.

12. (a) Explain in detail about Relational Algebra, Domain Relational Calculus and Tuple Relational Calculus with suitable examples.

Or

- (b) Briefly present a survey on Integrity and Security.

13. (a) Explain in detail about 1NF, 2NF, 3NF and BCNF with suitable examples.

Or

- (b) Describe about the Multi-Valued Dependencies and Fourth normal form with suitable example.

14. (a) Discuss in detail about Transaction Recovery, System Recovery and Media Recovery.

Or

- (b) Write down in detail about Deadlock and Serializability.

15. (a) Construct a B+ tree to insert the following key elements (order of the tree is 3) 5, 3, 4, 9, 7, 15, 14, 21, 22, 23.

Or

- (b) Describe in detail about how records are represented in a file and how to organize them in a file.



## PART B — (5 × 16 = 80 marks)

11. (a) (i) With a neat diagram, explain the structure of a DBMS. (9)
- (ii) Draw an E-R diagram for a small marketing company database, assuming your own data requirements. (7)

Or

- (b) (i) Compare the features of file system with database system. (8)
- (ii) Explain the differences between physical level, conceptual level and view level of data abstraction. (4)
- (iii) Mention any four major responsibilities of DBA. (4)

12. (a) (i) Consider the following relational database
- employee (employee-name, street, city)
- works ( employee-name, company-name, salary)
- company (company-name, city)
- manages (employee-name, manager-name)

Give an expression in SQL to express each of the following queries :

Find the names and cities of residence of all employees who work for XYZ Bank. Find the names, street address, and cities of residence of all employees who work for XYZ Bank and earn more than Rs. 10,000 per annum.

Find the names of all employees in this database who live in the same city as the company for which they work.

Find the names of all employees who live in the same city and on the same street as do their managers. (4 × 3 = 12)

- (ii) Define the term distributed database management system and mention the issues to be considered in the design of the same. (4)

Or

- (b) (i) What are the relational algebra operations supported in SQL? Write the SQL statement for each operation. (12)
- (ii) What is data integrity? Explain the types of integrity constraints. (4)



13. (a) (i) Explain 1NF, 2NF, 3NF and BCNF with suitable example. (8)

(ii) Consider the universal relation  $R = \{A, B, C, D, E, F, G, H, I\}$  and the set of functional dependencies  $F = \{(A, B) \rightarrow \{C\}, \{A\} \rightarrow \{D, E\}, \{B\} \rightarrow \{F\}, \{F\} \rightarrow \{G, H\}, \{D\} \rightarrow \{I, J\}\}$ . What is the key for R? Decompose R into 2NF, then 3NF relations. (8)

Or

(b) What are the pitfalls in relational database design? With a suitable example, explain the role of functional dependency in the process of normalization. (16)

14. (a) (i) Explain about immediate update and deferred update recovery techniques. (8)

(ii) Explain the concepts of serializability. (8)

Or

(b) (i) Explain Two-phase locking protocol. (8)

(ii) Describe about the deadlock prevention schemes. (8)

15. (a) (i) List the different levels in RAID technology and explain its features. (12)

(ii) Describe the different methods of implementing variable length records. (4)

Or

(b) (i) Explain the various indexing schemes used in database environment. (12)

(ii) Let relations  $r_1(A, B, C)$  and  $r_2(C, D, E)$  have the following properties :  $r_1$  has 20,000 tuples,  $r_2$  has 45,000 tuples, 25 tuples of  $r_1$  fit on one block, and 30 tuples of  $r_2$  fit on one block. Estimate the number of block accesses required, using each of the following join strategies for  $r_1 \bowtie r_2$  : (4)

- (1) Nested-loop join with  $r_1$  as outer relation
- (2) Block nested-loop join with  $r_1$  as outer relation
- (3) Merge join if  $r_1$  and  $r_2$  are initially sorted
- (4) Hash join (assuming that no overflow occurs).

Reg. No. : **Question Paper Code: E3067**

B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2010

Fourth Semester

Computer Science and Engineering

CS2255 — DATABASE MANAGEMENT SYSTEMS

(Common to Information Technology)

(Regulation 2008)

Time: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A — (10 × 2 = 20 Marks)

1. Explain the basic structure of a relational database with an example.
2. What are the functions of a DBA?
3. Give the usage of the rename operation with an example.
4. What do you mean by weak entity set?
5. What is normalization?
6. Write a note on functional dependencies.
7. What do you mean by a transaction?
8. Define the term ACID properties.
9. Describe flash memory.
10. List out the physical storage media.



## PART B — (5 × 16 = 80 Marks)

11. (a) (i) Discuss the various disadvantages in the file system and explain how it can be overcome by the database system. (6)
- (ii) What are the different Data models present? Explain in detail. (10)

Or

- (b) (i) Explain the Database system structure with a neat diagram. (10)
- (ii) Construct an ER diagram for an employee payroll system. (6)

12. (a) (i) Explain the use of trigger with your own example. (8)
- (ii) Discuss the terms. Distributed databases and client/server databases. (8)

Or

- (b) (i) What is a view? How can it be created? Explain with an example. (7)
- (ii) Discuss in detail the operators SELECT, PROJECT, UNION with suitable examples. (9)

13. (a). Explain 1NF, 2NF and 3NF with an example. (16)

Or

- (b) Explain the Boyce-Codd normal form with an example. Also state how it differs from that of 3NF. (16)

14. (a) (i) How can you implement atomicity in transactions? Explain. (8)
- (ii) Describe the concept of serializability with suitable example. (8)

Or

- (b) How concurrency is performed? Explain the protocol that is used to maintain the concurrency concept. (16)

15. (a) What is RAID? Explain it in detail. (16)

Or

- (b) Mention the purpose of indexing. How this can be done by B+ tree? Explain. (16)