31/12/2011

Roll No. ....

Total No. of Pages : 2

MCA/D11

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Database System

Paper : MCA–301

Time : Three Hours]

[Maximum Marks : 80

Note :– Question no.1 is compulsory. Attempt **FIVE** questions in all. In addition to compulsory question, attempt **FOUR** more questions by selecting **ONE** question from each Unit.

1. (a) Illustrate the redundancy and problems it can cause ?   3

   (b) What do you meant by the term controlled redundancy ?   3

   (c) Explain the term Integrated with respect to database.   3

   (d) Why do set theoretic operators require Union Compatibility ? 3

   (e) How Join operator is different from Cartesian product ?   3

   (f) Why can we not infer functional dependency from a particular relation state ?   3

   (g) How does a foreign key of relations relate primary keys ? Give example to illustrate your answer.   3

   (h) Discuss the limitations of log files.   3

UNIT–I

2. (a) What causes inconsistency in database ?   3

   (b) How do you ensure consistency in database ?   4

   (c) Discuss the role of Integrity Constraints or Relations in respect to consistency.   7

3. What is the purpose of the E-R diagram ? Construct an E-R diagram for a University System which should include information about students, departments, professors, courses, which students are enrolled

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Contd.

in which course, which professors are teaching which courses, student grades, which course a department offers. Make suitable assumptions wherever required. 14

UNIT–II

4. (a) What makes a DBMS an RDBMS ? 6

   (b) Differentiate between SQL and PL/SQL. How the loops are implemented in PL/SQL ? Explain using suitable example. 8

5. Give an account of various modelling constructs used in Network and Hierarchical data model. 14

UNIT–III

6. What do you mean by Normalization ? Take an example of your choice to explain 1NF, 2NF, 3NF and BCNF. Also show that if a relation is in BCNF then it is also in 3NF. 14

7. (a) Differentiate between FD, MVD and JD. 5

   (b) What do you mean by Database Design ? Explain the process of designing Database. 9

UNIT–IV

8. (a) What do you mean by Concurrent Access to the database ? Discuss, with examples, the types of problems that can occur in a multi user environment when concurrent access to the database is allowed. 8

   (b) How is time-stamp based protocols for concurrency control different from locking-based protocols ? 6

9. (a) How does DBMS ensure atomicity property of transaction ? 5

   (b) Discuss the limitations of log files. 3

   (c) Differentiate between the following :

      (i) Undo and Redo operation

      (ii) Immediate Update and Deferred Update. 3+3

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UNIT—IV

8. (a) Discuss some simplified NP-hard problems.   7

   (b) What are NP hard and NP complete problems ? Explain with
       examples.   7

9. Explain the following with examples :

   (a) Cook's Theorem

   (b) Approximation Algorithms.   14