

02009

MCA (III Year)

Term-End Examination

June, 2011

**CS-15 : RELATIONAL DATABASE
MANAGEMENT SYSTEM**

Time : 3 hours

Maximum Marks : 75

Note : *Question number 1 is compulsory. Answer any three questions from the rest.*

1. (a) For a IT Training Company determine the entities of interest and the relationships that exist between these entities. Draw an ER_Diagram for the system. Assume that IT Training Company offer many short term modular courses, meeting the demands of the IT industry. These short term courses leads to medium to long term specialized courses. 10
- (b) Why is decomposition of a relation required? Explain lossless join decomposition and dependency preservation with the help of an example. 10
- (c) What is Distributed DBMS ? Explain why replication of data is useful in Distributed DBMS. 5
- (d) What is BCNF ? Explain with an example how is it different from 3NF ? 5

2. (a) Consider the following relations : 3x3=9

GRADE (Course_ID, S_ID, Grade)

STUDENT (S_ID, S_Name, Programme - ID, Semester)

Programme (Programme -ID, Course_ID, Semester)

Write the relational algebraic expression for the following queries.

(i) List all the "MCA" ("MCA" is programme ID) students who got grade 'A' in "course_ID = "DBMS"

(ii) List the name of all the students who are in programme ID = "MBA" and obtained Grade 'B' in course ID = "IT for Management"

(iii) Find the total number of students who scored 'A' in course whose ID is "Computer Fundamentals".

(b) What is Log ? Explain how Logs are created in DBMS. Also explain log based recovery in databases. 6

3. (a) Explain how a DBMS can be secured. 5

(b) Explain join dependency and multivalued dependency with the help of an example. 6

(c) Compare Read/write locks with binary locks. 4

4. (a) Consider the relation $R = \{A, B, C, D, E\}$ 10
and the set of functional dependencies :
 $F = \{ A \rightarrow BC, AC \rightarrow D, D \rightarrow BC, DC \rightarrow E \}$
List the candidate keys of R. Decompose the
relation R to its highest normal form.
- (b) What is the need of concurrency control in 5
transactions ? Explain time stamp ordering
protocol for concurrency control.
5. Explain the following with the help of example/
diagram if needed. 5x3=15
- (a) Query Optimization
 - (b) Data Fragmentation
 - (c) Dead lock Detection
 - (d) Generalization and specialization in ER
diagram
 - (e) Checkpoints in database recovery.
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