Sem - III

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CSE201 Enrol. No. 4309..

[ETD]

END SEMESTER EXAMINATION : NOV.–DEC., 2015

DATABASE MANAGEMENT SYSTEMS

Time : 3 Hrs. *Maximum Marks : 70*

Note: ***Attempt questions from all sections as directed.***

SECTION – A (30 Marks)

Attempt any **five** *questions out of* **six.**
Each question carries **06** *marks.*

1. What is the difference between DBMS and RDBMS ? Explain E.Codd's rule for RDBMS.

2. Explain ER Model. What are the different types of mapping constraint ? Draw ER Diagram for hospital with a set of patients and medical doctors.

3. Define the following terms :–

   (a) Weak & strong entity set

   (b) Database Languages

   (c) Data Abstraction

P.T.O.

4. (a) Explain the distinction among the terms, Primary key, Unique key and foreign key.

(b) Define Boyce-Codd normal form. How does it different from Third normal form ?

5. Consider the scheme S = (V, W, X, Y, Z)

Suppose the following F.D. hold :

$Z \rightarrow V$, $W \rightarrow Y$, $XY \rightarrow Z$, $V \rightarrow WX$

State whether the following decomposition of scheme S is lossless join decomposition. Justify your answer.

(i) $S_1 = (V, W, X)$

$S_2 = (V, Y, Z)$

(ii) $S_1 = (V, W, X)$

$S_2 = (X, Y, Z)$

6. Given a set of Functional Dependency

$A \rightarrow B$, $ABCD \rightarrow E$ and $EF \rightarrow G$

Is $ACDF \rightarrow G$, implied by the set of given FD's ? Justify your answer.

SECTION – B (20 Marks)

Attempt any **two** *questions out of* **three.**
Each question carries **10** *marks.*

7. Define the following terms :

(a) Super Key

(b) Candidate Key

(c) Triggers

8. Explain Query optimization process with various query optimization techniques with example.

9. Consider the following two transactions :

T31 : Read (A)
Read (B)
If A = 0 then B:=B+1
Write (B)

T32 : Read (B)
Read (A)
If B=0 then A:=A+1
Write (A)

P.T.O.

Add lock and unlock instructions to transactions T31 and T32 so that they observe the two phase protocol. Can the execution of these transactions result in a deadlock.

SECTION – C (20 Marks)

(Compulsory)

10. (a) Consider the following scheme :

Degree (degcode, name, subject)

Candidate (seatno, degcode, name, semester, month, year, result)

Marks (seatno, degcode, semester, month, year, papercode, marks)

Write the following queries in SQL and Relational Algebra :

(i) Write a select statement to display all the degree codes which are there in the candidate table but not present in the degree table in the order of degcode.

(ii) Write a select statement to display the name of all candidates which have appearded for their M.Sc. (Physics) examination in the order of name.

(iii) Write a select statement to display the name, subject and the number of candidates for all degrees in which there are less than 5 candidates.

(iv) Write a select statement to display the names of all the candidates who have got less than 40 marks in exactly two subjects.

(v) Write a select statement to display the name of all the candidates who have got highest total marks in M.Sc (Math). (5)

(b) Explain Nested-loop joins and Block Nested-loop join algorithm. (7)

(c) What is deadlock? When does it occur? How is it detected in the database system? How it can be avoided? Discuss in detail. (8)

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