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Enrol. No. ....

CSE201

[ET]

END SEMESTER EXAMINATION : NOV.-DEC., 2018

## 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. Discuss the importance of architectural design of Database management system? Also throw some light on various query processing techniques used in database management system.
2. Explain various data constraints in database management system? Discuss requirement to specify constraint as assertions and actions as trigger.
3. Consider the following relational schema :

$R(A,B,C,D,E,F,G,H)$  with the following decompositions

$R_1 = (A,B,C,D)$ ,  $R_2 = (A,B,C,E,F)$ ,  $R_3 = (A,D,F,G,H)$  and FD's:  $AB \rightarrow C$ ,  $BC \rightarrow D$ ,  $E \rightarrow F$ ,  $G \rightarrow F$ ,  $H \rightarrow A$ ,  $FG \rightarrow H$ . Is the decomposition of  $R$  into  $R_1$ ,  $R_2$ ,  $R_3$  is lossy or lossless decomposition?

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4. Discuss join algorithm for query optimization technique with suitable example.

5. Define Boyce-codd normal form, how BCNF is different from 3NF. Why is considered stronger form of 3NF?

6. Write a note on following :  
(a) Distributed database management system  
(b) OODBMS (object oriented DBMS)

**SECTION – B (20 Marks)**

*Attempt any two questions out of three.*

*Each question carries 10 marks*

7. A database is being constructed to keep track of the teams and games of sports league. A team has a number of plays, not all whom play in each game, it is desired to keep track of the plays participating in each game, the positions they play in that game, and the result of each game, draw a ER schema diagram of such application, state and Consider suitable assumption wherever required, chose sports of your liking.

8. Consider the following relational schema  
employee (person-name, street, city)

works (person-name, company-name, salary)  
company (company-name, city)  
manages (person-name, manager-name)

Represent the following queries using Relational Algebra and SQL.

- (a) Find the names, street address, and cities of residence of all employees who work for First Bank Corporation and earn more than \$10,000 per annum.
  - (b) Find the names of all employees in this database who live in the same city as the company for which they work.
  - (c) Find the names of all employees who live in the same city and on the same street as do their managers.
  - (d) Find the names of all employees in this database who do not work for First Bank Corporation.
  - (e) Find the names of all employees who earn more than every employee of Small Bank Corporation.
9. (a) Differentiate between Serializability, Conflict Serializability and view Serializability schedule using suitable example. (5)

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- (b) Discuss the significance of concurrency control, what are different concurrency control measures used in DBMS. (5)

**SECTION - C (20 Marks)**  
*(Compulsory)*

10. (a) Consider the universal relation : (5)

$R = (A, B, C, D, E, F, G, H, I, J)$  And the set of functional dependencies G as given below :

$$G\{AB \rightarrow C, BD \rightarrow EF, AD \rightarrow GH, A \rightarrow I, H \rightarrow J\}$$

- (i) Determine the key for R  
 (ii) Decompose R into second normal form  
 (b) What are the various types of Distributed Database Systems? Explain data fragmentation in distributed database systems? (5)

- (c) Consider a relational scheme  $R = (A, B, C, D, E)$  and following set of multi valued dependencies :

$M = (A \rightarrow BC, B \rightarrow CD, E \rightarrow AD)$ . Give a lossless join decomposition of scheme R into fourth normal form?

(5)

- (d) Explain Deductive databases & Digital Libraries.  
 (5)