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**CSE201** Enrol. No. .....

[ET]

END SEMESTER EXAMINATION : APRIL-MAY, 2019

# 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. (a) What do you mean by a data model? Describe the different types of the data models used in database. (3)

   (b) How does the hierarchical data model address the problem of data redundancy? (3)

2. List the cost functions for the SELECT and JOIN operations.

3. Construct an E-R diagram for the registrar's office. Document all assumptions you make about the mapping constraints.

P.T.O.

Assumptions :

- A class meets only at one particular place and time. This diagram does not attempt to model a class meeting at different places or at different times
- There is no guarantee that the database does not have two classes meeting at the same place and time
- Each class has a unique instructor

4. Consider the following relational Schema and give the answers of following :

- Dealer(Dealer_no, Dealer name, Address)
- Part(Part_no, Part_Name, Color)
- Assigned_To(Dealer_no, Part_no, cost)

(a) Find names of dealers that supply red parts.

(b) Find names of dealers that supply whole red parts.

(c) Find names of dealers that supply both red and yellow parts.

5. Discuss the concept of data independence and explain its importance in a database environment.

6. Define the following terms :

- Data Independence
- Query Processor
- DDL processor
- DML Processor
- Run time database manager

## SECTION – B (20 Marks)

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

7. (a) Explain the difference between physical and logical data independence. (3)

(b) Consider a university database for the scheduling of classrooms for -final exams. This database could be modeled as the single entity set exam, with attributes course-name, section-number, room-

number, and time. Alternatively, one or more additional entity sets could be defined, along with relationship sets to replace some of the attributes of the exam entity set, as

- course with attributes name, department, and c-number
- section with attributes s-number and enrollment, and dependent as a weak entity set on course
- room with attributes r-number, capacity, and building (7)

8. (a) Explain how heuristic query optimization is performed with an example. (5)

(b) A relation R(ABCDEFGHIJ) has FD : {AB → C, A DE, B → F, F → GH, D → IJ}.

- Is R is in 1NF, 2NF? Explain
- Is R is in BCNF or 3NF?
- Find all the candidate keys of R. Justify your answer (5)

9. (a) Explain the ACID properties of a database transaction? Discuss each of these properties and how they relate to the concurrency control. Give examples to illustrate your answer. (5)

(b) Write a short note on the following topics :

- Distributed Databases
- Digital Libraries (5)

**SECTION – C (20 Marks)**

*(Compulsory)*

10. (a) Discuss the reasons for converting SQL Queries into relational algebra queries before query optimization is done? (10)

(b) What happens if the following schedule will execute using :

- BTSO Protocol (Basic Timestamp Ordering Protocol)
- TWRTSO Protocol (Thomas Write Rule Timestamp Ordering Protocol

P.T.O.

| 10 | 20 | 30 |
|---|---|---|
| T1 | T2 | T3 |
| R1(A) | | |
| | | W3(A) |
| | | R3(B) |
| | W2(A) | |
| W1(B) | | |

(10)

(500)