Code No: 813AP

| | **R13** |

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
MCA III Semester Examinations, August - 2017
DATABASE MANAGEMENT SYSTEMS

Time: 3 Hours   **Max. Marks: 60**

Note: This question paper contains two parts A and B.

Part A is compulsory which carries 20 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 8 marks and may have a, b, c as sub questions.

PART - A

5 × 4 Marks = 20

1.a)   What is view? How does a view support logical data independence?   [4]
  b)   What aggregate operators does SQL supports? Explain.   [4]
  c)   What are the advantages of normalized relations over the unnormalized relations? [4]
  d)   What is transaction? In what ways is it different from an ordinary program? Define ACID properties.   [4]
  e)   What is the difference between a primary index and a secondary index? What is a duplicate data entry in an index? Can a primary index contain duplicates?   [4]

PART - B

5 × 8 Marks = 40

2.a)   Explain the difference between external, internal, and conceptual schemas. How are these different schema layers related to the concepts of logical and physical data independence?
  b)   Which of the following plays an important role in representing information about the real world in a database? Explain briefly.   [4+4]
         i) DDL
         ii) DML
         iii) Data model.

OR

3.a)   Explain different constructs that adds expressiveness to the ER Model?
  b)   What are integrity constraints? Define the terms primary key constraint and foreign key constraints.   [5+3]

4.   Consider the following schema:
        Suppliers (*sid*: integer, *sname*: string, *address*: string)
        Parts (*pid*: integer, *pname*: string, *color*: string)
        Catalog (*sid*: integer, *pid*: integer, *cost*: real)
        The key fields are underlined. The Catalog relation lists the prices charged for parts by suppliers. Write the following queries in relational algebra, tuple relational calculus, and domain relational calculus.
        a) Find the names of suppliers who supply some red part.
        b) Find the sids of suppliers who supply every part.
        c) Find the pids of parts supplied by at least two different suppliers.
        d) Find pairs of sids such that the supplier with the first sid charges more for some part than the supplier with the second sid.   [8]

OR

5.a) What is nested queries? What is correlation in nested queries? How would you use the operators IN, EXISTS, UNIQUE, ANY, and ALL in writing nested queries? Why are they useful? Illustrate your answer with example.

b) Why can triggers be hard to understand? Explain the difference between triggers and integrity constraints, and describe when you would use triggers over integrity constraints and vice versa. What are triggers used for? [4+4]

6.a) Define 1NF, 2NF, 3NF and BCNF. What is the motivation for putting a relation in BCNF?

b) Consider a relation R with five attributes ABCDE. You are given the functional dependencies: A →B, BC → E, and ED → A.

List all keys for R.

Is R in 3NF?

Is R in BCNF? [5+3]

OR

7. Differentiate functional dependency, multi valued dependency and join dependency. Explain 5NF with example. [8]

8.a) Contrast timestamps used for deadlock prevention vs. concurrency control.

b) Distinguish between 2PL and strict 2PL protocols. [3+5]

OR

9.a) How does recovery manager ensure atomicity of transactions?

b) When a system recovers from a crash? In what order must transaction be undone and redone? Why is this order important? [3+5]

10.a) Explain the difference between hash indexes and tree indexes.

b) Explain the different file organization methods. [3+5]

OR

11. Explain the following.

a) Indexed seauential access method.

b) Extendable hashing. [4+4]

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