R13

Code No: 813AP

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
MCA III Semester Examinations, January - 2018
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) Give history of database systems. [4]
b) Explain set operations in relational algebra. [4]
c) What is normalization? What are useful normal forms? [4]
d) Explain about 2PL, serializability and recoverability. [4]
e) Distinguish between primary and secondary indices. [4]

PART - B

5 × 8 Marks = 40

2.a) Describe class hierarchies in ER model.
b) Give a brief note on database languages. [4+4]

OR

3.a) What is a foreign key constraint? Why are such constraints important? What is referential integrity? Give examples.
b) What is DBA? Write DBA responsibilities. [4+4]

4.a) Explain various types of joins with examples.
b) Explain logical connectives with examples. [4+4]

OR

5. 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, and the domain of each field is listed after the field name. Thus sid is the key for Suppliers, pid is the key for Parts, and sid and pid together form the key for Catalog. 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 some red or green part.
c) Find the sids of suppliers who supply some red part or are at 221 Packer Ave.
d) Find the sids of suppliers who supply some red part and some green part. [8]

6. Consider a relation R with attributes ABCDE. Let the following FDs be given: A → BC, BC → E, and E→DA. Similarly, let S be a relation with attributes ABCDE and let the following FDs be given: A → BC, B → E, and E → DA. (Only the second dependency differs from those that hold over R.) You do not know whether or which other (join) dependencies hold.
   a) Is R in BCNF?
   b) Is R in 4NF?
   c) Is R in 5NF?
   d) Is S in BCNF?
   e) Is S in 4NF?
   f) Is S in 5NF? [8]

OR

7.a) Consider a relation R with five attributes ABCDE. You are given the following dependencies: A → B, BC → E, and ED → A.
   a) List all keys for R.
   b) Is R in 3NF?
   c) Is R in BCNF?

   b) Explain about inclusion dependencies. [4+4]

8.a) Discuss about transaction support in SQL.

   b) Explain about recovering from a crash recovery. [4+4]

OR

9.a) Write some anomalies associated with interleaved execution.

   b) Write a brief note on ARIES. [4+4]

10. Give comparison of three file organizations in detail. [8]

OR

11.a) Distinguish between extendable and linear hashing.

   b) Explain levels of redundancy. [4+4]

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