R15

Code No: 124CQ

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B.Tech II Year II Semester Examinations, May - 2017
DATABASE MANAGEMENT SYSTEMS
(Common to CSE, IT)

Time: 3 Hours Max. Marks: 75

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A

(25 Marks)

1.a) What is DBMS? What are the goals of DBMS? [2]
b) Explain about DDL and DML languages. [3]
c) Explain views in SQL language. [2]
d) Explain domain relational calculus. [3]
e) Define loss less join decomposition with example. [2]
f) What is the difference between 3NF and BCNF? [3]
g) What is locking Protocol? [2]
h) When are two schedules conflict equivalent? What is conflict serializable schedule? [3]
i) Why are tree-structure indexes are good for searches, especially range selections. [2]
j) What is the main difference between ISAM and B+ tree indexes? [3]

PART-B

(50 Marks)

2.a) What are the main components in a DBMS and briefly explain what they do.
b) Explain the following:
i) View of Data ii) Data Abstraction iii) Instances and Schemas. [5+5]

OR

3.a) Develop ER-Diagram for a hospital with a set of patients and a set of medical doctors. Associated with each patient a log of the various tests and examinations conducted.
b) What is relation? Differentiate between a relation schema and relation instance define the term arity and degree of a relation? What are domain constraints? [5+5]

4.a) Explain the fundamental operations in relational algebra with examples.
b) Explain the following Operators in SQL with examples:
i) SOME ii) IN iii) EXCEPT iv) EXISTS [5+5]

OR

5.a) Let R=(ABC) and S=(DEF) let r(R) and s(S) both relations on schema R and S. Give an expression in the Tuple relational calculus that is equivalent to each of the following.
i) $\sigma_{B=19}(r)$ ii) $\prod_{A,F,}(\sigma_{C=D}(r \times s))$ iii) $r \cap s$
b) What are integrity constraints? Define the terms primary key constrains and foreign key constraints. How are these expressed in SQL? [5+5]

6.a) What is normalization? What are the conditions are required for a relation to be in 2NF, 3NF and BCNF explain with examples.

b) Compute the closer of the following set of functional dependencies for a relation scheme. R(A,B,C,D,E) F={A→BC, CD→E, B→D,E→A}
List out the candidate keys of R. [5+5]

OR

7.a) What are the conditions are required for a relation to be in 4NF and 3NF explain with examples.

b) Compute the closer of the following set of functional dependencies for a relation scheme. R(A,B,C,D,E,F,G,H), F={ AB→C, BD→EF, AD→G,A→H}
List the candidate keys of R. [5+5]

8.a) What is transaction? Explain the ACID Properties of transactions.

b) Explain the Check point log based recovery scheme for recovering the database. [5+5]

OR

9.a) Describe the steps in crash recovery in ARIES.

b) Explain the *Time Stamp - Based Concurrency* Control protocol. [5+5]

10.a) Explain Deletion and insertion operations in ISAM with examples.

b) How does *Extendable hashing* use a directory of buckets? How does it handles insert and delete operations. [5+5]

OR

11.a) Explain how insert and delete operations are handled in a static hash index.

b) Explain deletion and insertion operation in *B+ trees*. [5+5]

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