

Code No: 114CQ

R13

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. [5+5]
  - b) Explain the following:
    - i) View of Data
    - ii) Data Abstraction
    - iii) Instances and Schemas.
- 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. [5+5]
  - 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. [5+5]
  - b) Explain the following Operators in SQL with examples:
    - i) SOME
    - ii) IN
    - iii) EXCEPT
    - iv) EXISTS
- 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)  $\sigma_{B=10}(r)$
    - ii)  $\prod_{A,F}(\sigma_{C=D}(r \times s))$
    - iii)  $r \cap s$
  - b) What are integrity constraints? Define the terms primary key constraints 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:  $R(A,B,C,D,E)$   $F=\{A \rightarrow BC, CD \rightarrow E, B \rightarrow D, E \rightarrow A\}$   
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.  $R(A,B,C,D,E,F,G,H)$ ,  $F=\{AB \rightarrow C, BD \rightarrow EF, AD \rightarrow G, A \rightarrow H\}$   
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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