R15

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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