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Total Number of Pages : 02

MCA
MCC304

3rd Semester Back Examination 2019-20

DATA BASE SYSTEMS

BRANCH : MCA

Time : 3 Hours

Max Marks : 70

Q.CODE : HB768

Answer Question No.1 which is compulsory and any FIVE from the rest.
The figures in the right hand margin indicate marks.

- Q1 Answer the following questions : (2 x 10)**
- a) What is data abstraction?
 - b) Differentiate between total specialization and partial specialization.
 - c) State the constraints that are included in a relational model.
 - d) Differentiate between left outer join and right outer join.
 - e) Name the different SQL data types.
 - f) What is semantic query optimization?
 - g) What are the phases of 2PL?
 - h) State the types of problems that can occur in a multi-user environment when concurrent access to the database is allowed.
 - i) Differentiate between read and write timestamps.
 - j) What do you mean by data mining?
- Q2 a) Describe the five components of the DBMS environment and discuss how they relate to each other. (5)**
- b) Explain logical and physical data independence and their importance in database design. (5)**
- Q3 a) Discuss the function and importance of conceptual modeling. (5)**
- b) Discuss the properties of a relation. (5)**
- Q4 a) Define five basic relational algebra operations. Define the join, Intersection and division operations in terms of these five basic operations. (5)**
- b) Explain how GROUP BY clause works. What is the difference between the WHERE and HAVING clauses? (5)**
- Q5 a) Describe the concept of transitive dependency and explain how this concept is used to define 3NF. (5)**
- b) Find the minimal set of functional dependencies that is equivalent to the following set of FDs: (5)**
- $F = \{A \rightarrow BC, B \rightarrow C, A \rightarrow B, AB \rightarrow C, AC \rightarrow D\}$
- Q6 Consider the universal relation $R = \{A, B, C, D, E, F, G, H, I, J\}$ and the set of functional dependencies $F = \{AB \rightarrow C, BD \rightarrow EF, AD \rightarrow GH, A \rightarrow I, H \rightarrow J\}$ (10)**
- i) What is the key(s) of R?
 - ii) Decompose R into 2NF and then 3NF relations.
 - iii) Decompose R into 3NF relations directly which is both lossless and dependency preserving.

- Q7** **a)** Explain the lock based protocols of concurrency control. **(5)**
 b) How does timestamp ordering protocol work? Explain with example. **(5)**
- Q8** **Write short Notes on any TWO :** **(5 x 2)**
- a)** OLAP
 b) Object relational databases.
 c) GIS