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Roll No ....

CS-5003 (CBGS)
B.E. V Semester
Examination, November 2018
Choice Based Grading System (CBGS)
Data Base Management System
Time : Three Hours

Maximum Marks : 70

Note: i)   Attempt any five questions.
　　　 ii) All questions carry equal marks.

1. a) Define Database Management System (DBMS). What are the major component of this system? Explain each component.
   b) What are the different Modules present? Explain in detail.

2. a) Draw an E-R diagram of university by determining entities of interest and the relationships that exist between these entities.
   b) Briefly explain the following:
       i)   Functions of DBA
       ii) Generalization, aggregation and specialization.

3. a) Discuss different types of keys. For each case, give a suitable example. What is Foreign key constraint? Why is such constraint important?
   b) Discuss the different relational algebra operations.

4. a) Consider the following relations (primary keys are underlined)
       i)   account (<u>acc - no</u>, balance, branch - name)
       ii) depositor (<u>acc-no</u>, <u>cust-no</u>)
       iii) customer (<u>cust-no</u>, name, city)
       iv) loan (<u>loan-no</u>, amt, branch-name)
       v)   borrower (<u>cust-no</u>. <u>loan-no</u>)

Solve the following queries using SQL.
   i)   Find all customer-no and loan-no who have a loan at the 'Perryridge' branch.
   ii) Find all customer who have an account but no loan at the bank.
   iii) Find branch-name and average account balance where average account balance is greater than 1000.
   b) Discuss the correspondence between ER model constructs and relational model constructs. Show how each ER model construct can be mapped to relational model and also discuss alternative mappings.

5. a) Compute the closure of the following FD for the relation schema.
       $R = \{A, B, C, D, E\}$
       $A \rightarrow BC$
       $CD \rightarrow E$
       $B \rightarrow D$
       $E \rightarrow A$
       List the candidate key R, reduce it in 3NF also.
   b) What is meant by term heuristic optimization? Discuss the main heuristic that is applied during query optimization. What is cost based optimization?

6. a) Define BCNF. How does it differ from 3NF? Explain briefly.
   b) What is meant by concurrent execution of database transaction in a multiuser system? Discuss why concurrency control is needed and give example.

7. a) Explain how strict 2-phase locking is implemented. Show with the example.
   b) What is distributed Database system? How it is different from the centralized Database system? Give the uses of distributed system.

8. Write short notes on the following (any four):
   i)   Serialisability
   ii) Triggers
   iii) Comparison between OODBMS and DBMS
   iv) Normalization
   v)   Timestamp ordering protocol for concurrency control.

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