Code No: I5803/R16

M. Tech. I Semester Regular/Supple Examinations, Jan/Feb-2018

DATABASE MANAGEMENT SYSTEMS

Computer Science & Engineering (58)

Time: 3 Hours **Max. Marks: 60**

Answer any FIVE Questions
All Questions Carry Equal Marks

1. a What are the responsibilities of the DBA and the database designers?
   b Draw an E-R Diagram for the hospital management system. Assume your own entities (Minimum of 5 entities), attributes and relations. Explain in detail.

2. a Consider the following relations for a database that keeps track of business trips of sales persons in a sales office:
   Salesperson (Salespersonid, Name, Start-year, Dept-no)
   Trip (Salespersonid, from, to, Departure-date, Return-date, trip-id)
   Expense (trp-id, AccountNo, Amount)
   Specify the foreign keys for the above schema.
   Then specify the following queries in relational algebra.
   i. Give the details (all attributes of trip relation) for trip that exceeded
      a. 10,000/- in expenses.
   ii. Print the 'Salespersonid' and 'Name' of the salespersons who took trips to 'delhi'.
   iii. Print the total trip expenses incurred by the salesman with Salespersonid = '504'.
   b Explain the following clauses with examples :
   i) Form ii) Having iii) Order by iv) Group by

3. a Consider the universal relation R = {A, B, C, D, E, F, G, H, I, J} and the set of functional dependencies F={ {A,B} -> {C},A} -> {D,E},{B}->{F},{F} ->{G,H},{D} -> {I,J}}. What is the key for R? Decompose R into 2NF, then 3NF relations.
   b Write loss-less Boyce Codd Normal Form decomposition algorithm

4. a Explain how strict 2-phase locking is implemented. Show them with an example.
   b What are the rules followed when shared/exclusive locking scheme is used ?

5. a Illustrate with an example how concurrency is controlled using a B+ tree.
   b Discuss in detail about Hash Based Indexing.

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6. a List the operations of the relational algebra and the purpose of each.
   b Explain the following with an example in SQL
      i) Unspecified where-clause and use of asterisk.
      ii) Exist and not exists
      iii) Explicit sets and NULLS*
      iv) Renaming attributes and joined tables.

7. a What is a minimal set of functional dependencies? Give the algorithm to find a minimal cover for a given set of dependencies.
   b Explain the concepts of multi valued dependency and fourth normal form with suitable examples.

8. a Describe the shadow paging recovery technique. Under what circumstances it does not require a log?
   b Describe the three phases of the ARIES recovery method.

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