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01162

B.TECH - VIEP - CSE - V SEMESTER

Term-End Examination

December, 2011

BICS-011 : DATABASE MANAGEMENT SYSTEM

Time : 3 hours *Maximum Marks : 70*

Note : Seven (7) questions are required to be answered. From the last question (question no. 10 - short note type) any two (2) are to be attempted.

1. (a) What is 3 - schema architecture ? Explain logical and physical data independence ? 5

   (b) What are the different types of indexing ? Explain indexing using B^+ trees. 5

2. What is data modelling ? Design an ER model for a database to represent the following application :- **2+8=10**

   Banks have customers. Customers are identified by name, cust id, phone number and address. Customers can have one or more accounts. Accounts are identified by an account number, account type (saving, current) and a balance. Customers can avail loans. Loans are identified by loan id, loan type (car, home, personal) and an amount. Banks are identified

by a name, code and the address of the main office. Banks have branches. Branches are identified by a branch number, branch name and an address. Accounts and loans are related to the banks branches.

3. (a) Differentiate between $2\frac{1}{2}+2\frac{1}{2}=5$

   (i) Stored versus derived attribute

   (ii) Strong versus weak entity.

   (b) What are the different types of cardinality constraints ? Explain each with example. 2+3=5

4. (a) What is relational model ? Write down the steps for converting ER model to relational model with an example. 1+6=7

   (b) What is primary key, candidate key and super key using suitable example. 3

5. (a) What is functional dependency ? Explain full, partial and transitive functional dependency. 2+3=5

   (b) Given a relational schema R(ABCDE) and a functional dependency $2\frac{1}{2}+2\frac{1}{2}=5$

   FD = {A→B, C→D, D→E }

   (i) What is candidate key ?

   (ii) What normal form is it in ? Explain.

6. (a) What is closure of a functional dependency ? Find the closure of the attribute B and also check whether B→GB is in F^+ for the following **1+4=5**

R={A,B,C,D,E }

F={B→CD, E→F, D→E, B→A, AD→ B, F→G}

(b) What is cannonical cover ? Find a minimal cover of **1+4=5**

F={AB→D, B→C, AE→B, A→D, D→ EF}

7. (a) What are the different types of join operations in relational algebra ? Explain each with suitable example. **5**

(b) What are aggregate functions ? Explain each with examples. **5**

8. (a) What is transaction in DBMS ? Explain the ACID property of transaction. **5**

(b) What are the different states of a transaction ? **5**

9. (a) What is cascading schedule ? How deadlock can be detected ? **2+3=5**

(b) What is SQL ? Consider the following schema : **1+2+2=5**

Supplier (sid:integer, sname: string, address : string)

Parts (pid : integer, pname : string, color : string)

Calalog (sid : integer, pid : integer, cost : real)

Write down the following queries in SQL

(i) Find the names of suppliers who supply some red part.

(ii) Find the sids of suppliers who supply some red or green part.

10. Write short notes on - *(any two)* 5+5=10

(a) Specialization

(b) Database recovery

(c) Two Phase Locking