No. of Printed Pages : 4

BICS-011

B.TECH - VIEP - CSE - V SEMESTER

Term-End Examination

June, 2012

BICS-011 : DATABASE MANAGEMENT SYSTEM

00105

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 are the characteristics of database management system ? Explain each in brief. 5

   (b) Explain primary indexing, secondary indexing and clustering. 5

2. What is ER model ? 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 following in brief : $2\frac{1}{2}+2\frac{1}{2}=5$

   (i) Simple Versus composite attribute

   (ii) Single versus Multi-valued attribute

   (b) What is participation constraint ? Explain total and partial participation constraints. 1+4=5

4. (a) What are different relational algebra operations ? Explain each. 1+5=6

   (b) Consider the following schema : 2+2=4

   Suppliers

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

   Parts

   (*pid : integer,* Pname : string, color : string)

   Catalog (*sid : integer, pid : integer,* cost : real)

   Write down the following queries in relational algebra.

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

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

5. (a) What do you mean by normalization ? Explain 1 NF, 2NF, 3NF and BCNF. **1+4=5**

(b) Consider the following schema and functional dependency. **5**

R (ABCDE) F = {A→B, B→AE, AC→D}

Decompose the above relation into BCNF if it is not already in BCNF.

6. (a) What is equivalence sets of functional dependencies ? Verify whether the following two sets of functional dependencies are equivalent or not. **1+4=5**

F = {A→B, B→C, AC→D}

G = {A→B, B→C, A→D}

(b) What do you mean by schedule ? Explain conflict serializability and view serializability. **1+4=5**

7. (a) What is tuple calculus ? How it is different from domain calculus ? **5**

(b) "Withdraw Rs 1000 from a saving account using ATM". How ACID property can be ensured for the above transaction, explain. **5**

8. (a) What is two phase locking ? Explain static and dynamic two phase locking. **2+1½+1½=5**

(b) Two phase scheduler is subject to deadlock. Explain with example. 5

9. (a) Define these terms in brief : 5

(i) atomicity

(ii) consistency

(iii) isolation

(iv) durability

(v) Time stamp

(b) What is the phantom problem ? Can it occur in a database, where the set of database object is fixed and only the values of objects can be changed ? 5

10. Write short notes on *(Any two)* : 5+5=10

(a) Relational Calculus.

(b) Generalization.

(c) Deadlock.