

DiplETE – CS (OLD SCHEME)

Code: DC10
Time: 3 Hours

Subject: DATABASE MANAGEMENT SYSTEMS
Max. Marks: 100

JUNE 2011

NOTE: There are 9 Questions in all.

- **Question 1 is compulsory and carries 20 marks. Answer to Q.1 must be written in the space provided for it in the answer book supplied and nowhere else.**
- **The answer sheet for the Q.1 will be collected by the invigilator after 45 Minutes of the commencement of the examination.**
- **Out of the remaining EIGHT Questions answer any FIVE Questions. Each question carries 16 marks.**
- **Any required data not explicitly given, may be suitably assumed and stated.**

Q.1 Choose the correct or the best alternative in the following: (2×10)

a. The first network database is

- (A) Ingress (B) DBTG Codasyl
(C) Database I (D) SAP

b. If D_1, D_2, \dots, D_n are domains in a relational model then the relation is a table which is a subset of

- (A) $\{D_1, D_2, \dots, D_n\}$ (B) $D_1 \cup D_2 \cup \dots \cup D_n$
(C) $D_1 \times D_2 \times \dots \times D_n$ (D) Maximum(D_1, D_2, \dots, D_n)

c. The table generated on compilation of data stored in language(DDL) are stored in

- (A) Data Dictionary (B) Data File
(C) Meta data (D) Virtual table

d. When one column of a table refers to the values in another column of the same table, it introduces a _____ integrity constraint.

- (A) referential (B) self referential
(C) unique (D) recursive

e. Transactions are initiated by BEGIN TRANSACTION and terminated by

- (A) COMMIT TRANSACTION
(B) ROLLBACK TRANSACTION.
(C) COMMIT TRANSACTION or By ROLLBACK TRANSACTION
(D) None of these

f. Which of the following is not the proper state of transaction?

- (A) Partially aborted (B) Partially committed
(C) Aborted (D) Committed

- g. Which is not true about a view?
- (A) It is a definition of a restricted portion of the database.
 - (B) It is the means for implementing integrity constraints.
 - (C) It is always updateable like any other table.
 - (D) All are true.
- h. Every weak entity set can be converted to a strong entity set by
- (A) simply adding appropriate
 - (B) using aggregation
 - (C) using generalization
 - (D) repeating the entity set several times
- i. The overall design of database is called
- (A) Schema of the database
 - (B) Structure of the database
 - (C) The screen of database
 - (D) View of the database
- j. In a hierarchal database, a hashing function is used to locate the
- (A) Collision
 - (B) Primary Key
 - (C) Root
 - (D) Duplicate records

**Answer any FIVE Questions out of EIGHT Questions.
Each question carries 16 marks.**

- Q.2** a. Discuss the Database in details. Describe the implications of the Database approach. (8)
- b. Describes the three-schema architecture. Why do we need mapping between schema levels? How do different schema definition languages support this architecture? (8)
- Q.3** a. Draw an E-R diagram for a hospital with a set of patients and a set of medical doctors. Associate with each patient a log of the various tests and examinations conducted. Also construct appropriate tables for the E-R diagram. (8)
- b. Could an E-R diagram have more than one relationship between the same two entity set and can be the total system included in the E-R diagram? Explain (8)
- Q.4** a. What are the main goals of RAID technology? How does disk mirroring help to improve reliability? What are the advantages and disadvantages of disk mirroring? (8)
- b. Differentiate between
- (i) Spanned and unspanned records
 - (ii) Heap files and Sorted files (8)

- Q.5** a. Consider the relations where the primary keys are underlined.
employee (person_name, street, city)
works (person_name, company_name, salary)
company (company_name, city)
manages (person_name, manager_name)
Give an expression in the relational algebra to express each of the following queries:
(i) Find the names of all employees who work for First Bank Corporation.
(ii) Find the names and cities of residence of all employees who work for First Bank Corporation.
(iii) Find the names, street address, and cities of residence of all employees who work for First Bank Corporation and earn more than \$10,000 per annum.
(iv) Find the names of all employees in this database who live in the same city as the company for which they work. **(8)**
- b. Explain outer join and outer union operations of relational algebra. **(8)**
- Q.6** a. What are the various types of the update operations on relations? Also explain the constraints on these update operations. **(8)**
- b. What is a view in SQL and what are advantages of creating views? Write syntax for creating and dropping views. Does the view exist if the table is dropped from the database? **(8)**
- Q.7** a. Consider the insurance following database where the primary keys are underlined. **(10)**
Construct the following SQL queries for this relational database.
(i) Find the number of accidents in which the cars belonging to “John Smith” were involved.
(ii) Update the damage amount for the car with license number “AABB2000” in the accident with report number “AR2197” to \$3000.
person (driver_id, name, address)
car (license, model, year)
accident (report_number, date, location)
owns (driver_id, license)
participated (driver_id, car, report_number, damage_amount)
- b. Show that, in SQL, <> **all** is identical to **not in**. **(6)**
- Q.8** a. Explain the Oracle process in detail. **(8)**
- b. What is the basic structure of Oracle Database System? Explain. **(8)**
- Q.9** Explain the following:
- (i) Recursive Relationship type
(ii) Functions in QBE
(iii) Relational Constraints
(iv) Data Independence **(4×4 = 16)**