22321

21222

3 Hours / 70 Marks Seat No. | | | | | | | | |

15 minutes extra for each hour

Instructions : (1) All Questions are compulsory.
(2) Answer each next main Question on a new page.
(3) Illustrate your answers with neat sketches wherever necessary.
(4) Figures to the right indicate full marks.
(5) Assume suitable data, if necessary.
(6) Use of Non-programmable Electronic Pocket Calculator is permissible.
(7) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. Attempt any FIVE of the following : **10**

(a) State the difference between physical and logical data independence.
(b) State the relative advantages of centralized databases.
(c) Define the terms primary key & candidate key.
(d) Enlist & state any four basic data types in SQL.
(e) Define query & query language.
(f) State the reason for calling certain functional dependencies as trivial functional dependencies.
(g) Define functional dependency.

2. Attempt any THREE of the following : **12**

(a) Describe the components of storage manager.
(b) To build a highly available distributed system, you must know what kinds of failures can occur.
  (i) List the possible types of failure in a distributed system.
  (ii) Which items in your list from part (i) are also applicable to a centralized system ?

(c) Construct an E-R diagram for a car-insurance company whose customers own one or more cars each. Each car has associated with it zero to any number of recorded accidents.

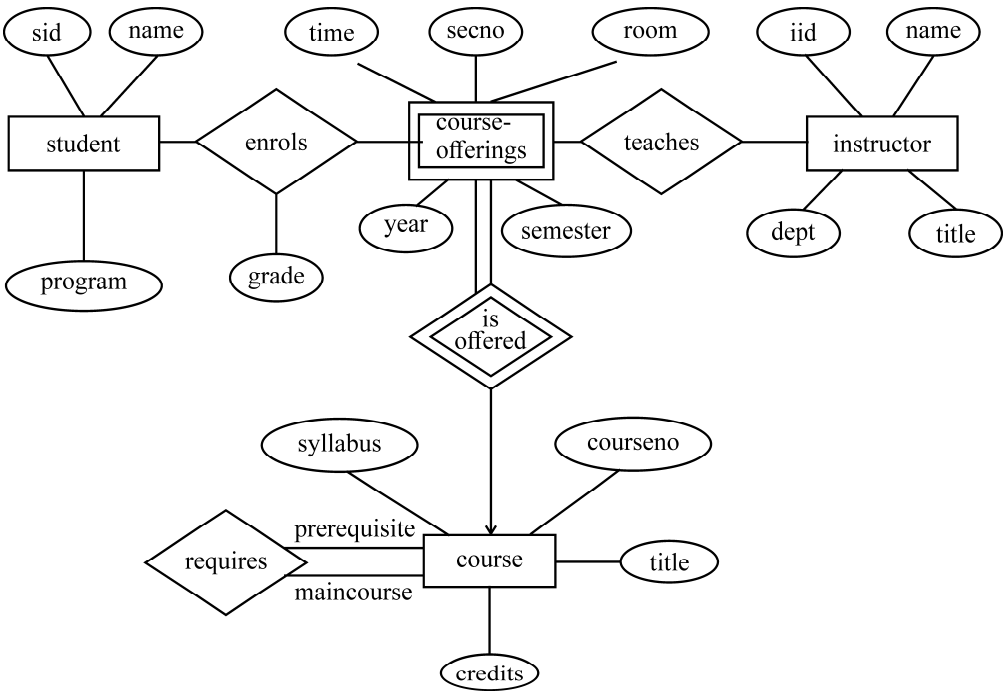
(d) Describe the three levels of data abstraction with diagram.

3. Attempt any THREE of the following : **12**

(a) List the three design goals for relational databases & state the reasons of most desirableness of it.

(b) Describe closure of functional dependencies w.r.t. various rules.

(c) Design a relational database for a university registrar's office. The office maintains data about each class, including the instructor, the number of students enrolled, the time & place of the class meetings. For each student – class pair, a grade is recorded.



(d) Explain the difference between the three storage types – volatile, non-volatile, & stable in terms of I/O cost.

4. Attempt any THREE of the following : **12**

(a) Describe second normal form with its example.

(b) List the ACID properties. Explain the usefulness of each.

(c) Describe the types of attributes.

(d) Describe Codd's rules of RDBMS.

(e) Describe various data models.

5. Attempt any TWO of the following : **12**

(a) Describe third normal form with suitable examples.

(b) Define relationship and relationship set. And describe mapping cardinalities.

(c) Describe DML language.

6. Attempt any TWO of the following : **12**

(a) Explain the various types of integrity constraints.

(b) Draw & explain the architecture of database management system.

(c) Consider the following employee database, where the primary keys are underlined. Give an expression in SQL for each of the following queries :

employee (employee – name, street, city)

works (employee – name, company – name, salary)

company (Company – name, city)

manages (employee – name, manager – name)

(1) Find the names of all employees who work for First Bank Corporation.

(2) Find the names and cities of residence of all employees who work for First Bank Corporation.

(3) Find all employees in the database who do not work for First Bank Corporation.
