Code: AC14 / AT11 **Subject: DATABASE MANAGEMENT SYSTEMS**
Time: 3 Hours **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 _____ rule specifies that an entity can be a member of only one subtype at a time.

(A) Removal **(B)** exclusion
(C) Disjoint **(D)** inclusion

b. An attribute or attributes that uniquely identify each row in a relation is called a

(A) Field pointer **(B)** Column
(C) Primary key **(D)** Foreign key

c. A database is an organized collection of _____ related data.

(A) not **(B)** badly
(C) physically **(D)** logically

d. What is a 'tuple'?

(A) An attribute attached to a record.
(B) Another name for the key linking different tables in a database.
(C) Another name for a table in an RDBMS
(D) A row or record in a database table

e. The advantages of Standard Query Language (SQL) include which of the following in relation to GIS databases?

(A) is widely used
(B) Uses a pseudo- English style of questioning
(C) It is good at handling geographical concepts.
(D) It is simple and easy to understand.

f. A(n) _____ specifies the number of instances of one entity that can be associated with the each instance of another entity.

(A) maximum **(B)** cardinality constraint
(C) limit **(D)** counter constraint

g. _____is a program module that provides the interface between the low-level data stored in database, application programs and queries submitted to the system

(A) storage manager **(B)** buffer manager
(C) transaction manager **(D)** file manager

h. Which of the following is NOT a function of a DBMS?

(A) Data storage, retrieval, and update
(B) Logical data dependence
(C) Recovery services
(D) Integrity services

i. This data model is based on real world that consists of basic objects called entities and of relationship among these objects

(A) data model **(B)** E-R model
(C) Object oriented model **(D)** none

j. The language that is used to specify the internal schema is

(A) DDL **(B)** VDL
(C) DML **(D)** SDL

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

Q.2 a. Briefly explain the different types of database users. **(8)**

b. Explain steps involved in query processing. List different measures of query cost. **(8)**

Q.3. a. What is sequential file processing? How is it different from Indexed Sequential file processing method? **(4)**

b. What is functional dependency? Given A1, A2, A3 and A4, list all functional dependencies satisfied by the relation given below: **(6)**

A1	A2	A3	A4
T1	U2	V1	W2
T1	U2	V2	W2
T2	U2	V1	W1
T2	U2	V3	W1

c. Explain the procedure to perform ER-to Relational mapping with the help of a suitable example. **(6)**

Q.4 a. Why 3NF decomposition is preferable over BCNF? Prove that BCNF decomposition is not a dependency preserving decomposition. **(6)**

b. What are the problems caused by data redundancies? Can data redundancies be completely eliminated when a database approach is used? Explain this with the help of an example. **(6)**

c. What do you mean by atomicity of transaction? Explain. **(4)**

Q.5 Consider the employee database.

- Employee (person-name, street, city)
- Works(person-name, company-name, salary)
- Company(company-name, city)
- Managers(person-name, manager-name)

(i) Write create table statements to create the above mentioned tables. Assume appropriate types for the attributes. **(6)**
(ii) Write select statement to find names of all employees who work for first Bank Corporation. **(3)**
(iii) Write select statement to find minimum salary of employees of first Bank corporation. **(3)**
(iv) Write relational algebra expression for query in part (ii). **(4)**

Q.6 a. State the conditions for the two schedules to be equivalent. Define a serializable schedule. **(6)**

b. Explain, how cascaded rollback can be avoided? **(4)**

c. Explain triggers in SQL with the help of an example. **(6)**

Q.7 a. Describe Two-Phase Commit (2PC) protocol, in terms of messages exchanged and log records written. Explain how this protocol is useful in Restart after a Failure. **(8)**

b. How a Transaction Processing Monitor manages memory and processor resources more effectively than a typical operating system? Explain. **(8)**

Q.8 a. Give a brief note on RAID technology. **(8)**

b. Explain the external sort-merge algorithm. **(8)**

Q.9 Briefly explain the following with the help of examples: **(4×4=16)**

(i) Natural-join
(ii) Outer-join
(iii) Tuple calculus
(iv) Views