IT-403(N)

B. E. (Fourth Semester) EXAMINATION, June, 2011 (Information Technology Engg. Branch)

DATABASE MANAGEMENT SYSTEM [IT-403(N)]

Time : Tliree Hours Maximum Marks : 100 Minimum Pass Marks : 35

Note : Attempt all questions. Internal choice is given. All questions carry equal marks.

1. (a) Discuss the main characteristics of the database approach and how it differs from traditional file system. 10

(b) What is the difference between logical data independence and physical data independence ? Which one is harder to achieve ? Why ? 10

Or

2. (a) Describe the three-schema architecture. Why do we need mapping between schema levels ? How do different schema definition languages support this architecture ? 10

(b) Discuss the naming conventions used for ER schema diagram. 10

3. (a) Discuss the main categories of data models. 10 (b) What is the difference between a key and a superkey ?

Why do we designate one of the candidate keys of a relation to be the primary key ? 10

Or

4. (a) Discuss the entity integrity and referential integrity constraints. Why is each considered important ? 10

(b) Compare among Hierarchical, Network and Relational data model. 10

5 (a) What are the relational algebra operations supported in SQL ? Write the SQL statements for each operation. 10 (b) What are the steps involved in query processing ? How would you estimate the cost of the query ? 10

Or

6. (a) What are the conditions to be fulfilled for two relations to be involved in a Union operation Why do the Union, Intersection and Set Difference operation require the operand relations to be Union compatible ? $^{K}10$

(b) In a tuple relational calculus query with *n* tuple variables, what would be the typical minimum number of join conditions ? Why ? What is the effect of having a smaller number of join conditions ? 10

7. (a) What is normalization ? Explain the normalization techniques using functional dependencies with relevant examples. 10

(b) Discuss the purpose of Boyce Codd normal form and describe how BCNF differ from and is stronger than 3NF. Illustrate your answer with an example. 10

Or

8. (a) List all FDs satisfied by the following table T. Note that these are all potentially possible functional dependencies but may not hold true for all states of this relation : 10

	A	B	C	D
1	a_1	b_1	c_1	d_1
2	a_1	b_1	c_2	d_2
3	a_1	b_2	c_2	d_1
4	a_1	b_2	c_4	d_4

(b) Describe the characteristics of a table that is not in normalized form. Describe how such a table is converted to a first normal form relation. 10

9. (a) Explain the security features provided in commercial query languages. 10 (b) Explain *four* important properties of transaction that a DBMS must ensure to maintain database. 10

Or

10. (a) Explain various recovery techniques during transaction in detail. 10

(b) Explain the following protocols for concurrency control : 10

(i) Lock based protocols

(ii) Time stamp based protocol