

**7E4171**

Roll No. :

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**B.Tech. (Sem. VII) (Main) Examination, January - 2010**  
**Electrical Engineering**  
**(7EE1 Data Base Management System)**

Time : 3 Hours]

[Total Marks : 80

[Min. Passing Marks : 24

*Attempt overall five questions selecting one question from each unit.. All questions carry equal marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing may suitably be assumed and stated clearly. Units of quantities used / calculated must be stated clearly.)*

Use of following supporting material is permitted during examination.

(Mentioned in form No. 205)

1. \_\_\_\_\_ Nil

2. \_\_\_\_\_ Nil

### UNIT - I

1 (a) What is DBMS? Explain purpose and goals of DBMS and also draw the overall structure of DBMS and explain its various components.

8

(b) Define the following terms :

(i) ER modelling

(ii) Relational data model

(iii) Generalization and specialization

(iv) Primary key, superkey and candidate key.

8

OR

1 (a) Define the following terms :

(i) Referential Integrity and Data atomicity

(ii) Concept of ER diagram

(iii) Theory of Normalization

(iv) Domain constraints and data models.

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- (b) Differentiate between external schema and internal schema. When is the concept of weak entity used in data modelling? Define the terms owner entity weak entity, identifying relationship.

## UNIT - II

- 2 (a) Consider the following relation  
Book (book-title, authorname, book-type, listprice, author-affiliation, publisher).  
Suppose the following functional dependencies exist  
book-title publisher, book-type  
book-type listprice  
authorname author-affiliation
- (i) What normal form is the relation in ? Explain your answer.
- (ii) Apply normalization until you cannot decompose the relations further. State the reasons behind each decomposition.

4+4

- (b) Explain following terms :
- (i) Physical and logical databases.
- (ii) Data abstraction and data independence.
- (iii) Relational algebra and Relational Calculus
- (iv) Primitive and Composite data types.

8

OR

- 2 (a) How does Boyce-Codd normal form differ from 3NF? Why is it considered stronger from 3NF? Also discuss 4NF and 5NF with suitable example.
- (b) Define the following terms :
- (i) Multivalued dependency
- (ii) Functional dependency
- (iii) Second Normal form
- (iv) Lossless decomposition.

8



## UNIT - III

- 3 (a) Let the following relational schema be given :
- Employee (SSN, name, age, elno)  
Salary (SSN, salary)  
work-on (project#, SSN)  
project (Project#, project\_name, location) for each of the following queries give an expression in SQL.
- Display the names of projects at "delhi".
  - Find the project-name of employee whose salary is greater than 10000.
  - Retrieve the name and SSN of employees working on Project# - A100.
- 10
- (b) What do you mean by Query and sub-query? Discuss the various characteristics of SQL and explain five aggregate functions with suitable example.
- 6

OR

- (a) Explain the following terms :
- Dynamic SQL
  - JDBC
  - DDL and DML.
- 7
- (b) Specify the following queries in relational algebra-
- Supplier (sid, sname, address)  
Part (sid, pname, color)  
Catalog (sid, pid, cost)
- find names of supplier who supply some red or green part.
  - find the sids of suppliers who supply every part.
  - find the sids of suppliers who supply red and green parts.
- 9

## UNIT - IV

- 4 What do you mean by schedule in the context of concurrent execution of transactions in RDBMS? Discuss physical data organization in sequential, indexed, random and Hashed files.

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OR

- 4 What is the difference between inverted and multilist structures? Also explain organizations of physical data in random, sequential and indexed files.

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### UNIT - V

- 5 (a) What do you mean by deadlock? What are the various conditions under which deadlock occurs? Discuss the wait-die and wound-wait in detail. 8
- (b) Define serialisability. Differentiate conflict and view serializability. 8

OR

- 5 (a) State with examples desirable properties of a transaction. What is the system log used for? 8
- (b) Explain following terms :  
(i) Lock based protocol  
(ii) Dead lock detection and recovery. 8