

5E5044

Roll No. \_\_\_\_\_

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5E5044

B. Tech. V Sem. (Main) Exam., Dec. 2014  
Electrical Engineering  
5EE4A Database Management System  
(Common with EE, EX)

Time: 3 Hours

Maximum Marks: 80

Min. Passing Marks: 24

Instructions to Candidates:

Attempt any **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 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

- Q. 1 (a) Define database and DBMS. How database approach is better than the traditional file approach? Explain [8]
- (b) Design an ERD for Airlines Reservation System consisting of flights, aircrafts, airports, fares, reservation, tickets, pilots, crew and passengers. Clearly highlight the primary keys and mapping cardinalities. [8]

### OR

- (a) Explain the components of DBMS. Also draw a neat diagram of the DBMS architecture. [8]

(b) Differentiate between the following-

[4×2=8]

- (i) Ternary Relationship and Aggregation
- (ii) Specialization and Generalization
- (iii) Super, Candidate and Primary keys
- (iv) Entity Sets, Attributes and Relationship Sets

## UNIT – II

Q. 2 (a) What is normalization? Explain its need. Define various normal forms with example. [8]

(b) Consider the following relations schemas - [4×2=8]

Shop (Shop-No, Sh-name, Sh- address)

Shop owner (Name, adders)

Owms- shop (Name, Shop no)

Customer (C- Name, C- address)

requires (C-Name, item)

has- stock (shop no, item)

supplies (Shop-no, C-Name, Item, price)

Write down the following queries in relational algebra-

- (i) Find the names of shop owners who supply some items to address 134, Mahatma Gandhi Road.
- (ii) Find the names of customers who have been supplied items of maximum total value.
- (iii) Find the names of customers who require the items which have not been supplied. List both the customers and the items.
- (iv) Find the names of customers who are supplied all their required items from a particular shop.

**OR**

- (a) Give formal definitions of TRC and DRC. What is meant by safety of expressions? [8]
- (b) Consider the following relation schema- [4×2=8]
- Employee (person-name, street, city)
- Works (person-name, Company-name, salary)
- Company (company-name, city)
- Manager (person-name, manager-name)
- Write the following queries in Relational Algebra-
- (i) Find the names of all employees who work for "First Bank"
  - (ii) Find the names of all employees who live in the same city as the company for which they work.
  - (iii) Find the names of all employees who live in the same city and on the same city as do their managers. rtuonline.com
  - (iv) Find the names of all employees who don't work for "Small Bank"

**UNIT – III**

- Q. 3 (a) Explain Embedded SQL and its need. How is it different from Dynamic SQL? [8]
- (b) Define a trigger. What are the uses of creating triggers? Explain with examples. [8]

**OR**

- (a) Explain the following clauses of SQL- [4×2=8]
- (i) ORDER BY
  - (ii) GROUP BY
  - (iii) HAVING
  - (iv) EXCEPT

- (b) What is a view? How can a view be used to implement database security? Explain with examples. [8]

### UNIT – IV

- Q. 4 (a) What is Hashing? Explain its implementation by explaining one Hashing Technique. [8]
- (b) What are various types of Indexes? Explain with examples. [8]

### OR

- (a) Explain a B<sup>+</sup> Tree node structure. Create a B<sup>+</sup> Tree of order 3 having the following key values- 105, 210, 350, 781, 50, 79, 73, 97, 500, 61, 100, 102, 49, 48 [8]
- (b) Explain the node structure of B Tree. What are the differences between B and B<sup>+</sup> Tree indexes? Explain. [8]

### UNIT – V

- Q. 5 (a) Define a Transaction. What are the properties of a Transaction? Explain various Transaction States with a neat diagram. [8]
- (b) What is a Deadlock? Explain various techniques of handling deadlocks. [8]

### OR

- (a) Define serializability. What are its various types? Explain. [8]
- (b) What all types of failures can occur in database systems? Explain various log based recovery techniques in detail. [8]

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