

B.E. Computer Science & Engineering (Model Curriculum) Sem-V  
**TEE102CS - Database Management System**

P. Pages : 2

Time : Three Hours



**GUG/W/23/13812 (S)**

Max. Marks : 80

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- Notes :
1. All questions carry equal marks.
  2. Due credit will be given to neatness and adequate dimensions.
  3. Assume suitable data wherever necessary.

1. a) What is DBA? What are the responsibilities of database administrator explain. 8
- b) What do you mean by data model? Discuss the various data models. 8

**OR**

2. a) Describe the various components of DBMS along with diagram. 8
- b) 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. 8
3. a) What is an attribute? What are the various types of attributes in designing ER-Model. 8
- b) Explain the following operations with relational algebra expression. 8
- |                        |                    |
|------------------------|--------------------|
| i) Select              | ii) Project        |
| iii) Cartesian-product | iv) Set-Difference |

**OR**

4. a) Write SQL queries for the following. 8  
employee (emp\_no, emp\_name, emp\_place, emp\_company)
- i) Give the name & place of employee working in 'Infosys'.
  - ii) Print the total number of employees in the database.
  - iii) Update the table employee, add one column emp\_salary
  - iv) Give a raise of 10% in salary for every employee in the table.
- b) Differentiate HAVING and WHERE clause in SQL. 8
5. a) Explain the algorithm for finding the closure of attribute sets. 8
- b) Explain 2NF and 3NF with example. 8

**OR**

6. a) Define minimal cover. Give the algorithm for finding minimal cover F for a set of functional dependencies E. 8
- b) Discuss lossy and lossless join Decomposition with example. 8

7. Consider the following two transactions. 8
- T<sub>31</sub> : read(A);  
      read(B);  
      If A = 0 then B := B + 1;  
      Write(B);
- T<sub>32</sub> : read(B);  
      read(A);  
      if B = 0 then A := A + 1;  
      write(A)

Add lock and unlock instruction to transactions T<sub>31</sub> and T<sub>32</sub>, so that they observe two phase locking protocol. Can the execution of these transactions result in a deadlock?

- b) Describe different types of failures in Database. 8

**OR**

8. a) Explain the following : 8
- i) Fixed-Length record
  - ii) Variable length records

- b) Explain Log-Based and shadow page recovery in database. 8

9. a) What is data warehouse? Explain its architecture. 8

- b) Explain the concept of shadow paging and panthom problem in database. 8

**OR**

10. Write note on **any four**. 16

- i) Parallel system.
- ii) Centralized system.
- iii) Client server system
- iv) Geographic databases
- v) Multimedia databases.

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