

SRK/KW/14/7088

Faculty of Engineering & Technology
Fifth Semester B.E. (Computer Technology) (C.B.S.)
Examination

DATABASE MANAGEMENT SYSTEM

Time : Three Hours]

[Maximum Marks : 80

INSTRUCTIONS TO CANDIDATES

- (1) All questions carry marks as indicated.**
- (2) Solve SIX questions as follows :**

Question No. 1 OR Question No. 2,

Question No. 3 OR Question No. 4,

Question No. 5 OR Question No. 6,

Question No. 7 OR Question No. 8.

1. (A) Consider the employee table with appropriate fields and write SQL statements for the following queries :
- (i) Display dept numbers and total no. of employees within each group.
 - (ii) Display the various jobs along with total salary for each of the jobs where total salary is greater than 50,000/-
 - (iii) Display the name of the employee who earns the highest salary.
 - (iv) Display dept. number and maximum salary of each department. 8
- (B) Explain Network and Hierarchical data model. 5

OR

- ~~2.~~ (A) What are the drawbacks of conventional file processing system ? Explain. 5
- (B) What is Data Dependence ? Why is it needed ? 3
- (C) Draw and explain three level architecture of DBMS. 5
3. (A) Solve the following queries using relational algebra. Consider the following relations :
- student (ssn, name, address)

course (code, title)

Registered (ssn, code)

- (i) List the codes of courses in which at least one student is registered.
 - (ii) List the titles of registered courses.
 - (iii) Titles of courses for which no student is registered.
 - (iv) Names of students and titles of courses they are registered to. 8
- (B) Distinguish between Domain relational calculus and Tuple relation calculus.
- (C) What do you mean by Integrity constraints ? 2

OR

4. (A) What is Normalization ? Why is it needed ? Take any unnormalized relation and convert it into 1NF, 2NF and 3NF. 8
- (B) What is MVD ? Compare 4NF and 5NF. 5
5. (A) Difference between the following :
- (i) B tree and B⁺ tree
 - (ii) Dense and Sparse Indexing. 8
- (B) Explain Trigger and Assertions. 5

OR

6. (A) What is bitmap index ? When and why is it needed ? 5
- (B) What is Static Hashing and Dynamic Hashing ? Explain. 4
- (C) Explain the basic structure of PL/SQL. 4
7. (A) Explain the techniques of query optimization. 5
- (B) What are the steps involved in processing a query ? 5
- (C) What is materialization ? Explain. 3

OR

8. (A) State the advantages of pipelining ? Explain when the pipelining cannot be used. 5
- (B) What are the different equivalence rules available in transformation of relational algebra. 8
- ~~9.~~ (A) What is serializability ? What are its different types ? Explain. 6
- (B) What is Deadlock ? How is it detected and prevented in DBMS ? 8

OR

10. (A) What is Transaction ? Explain the different properties of Transaction. 5

- (B) What is two phase locking protocol ? Explain various versions of 2PL. 5
- (C) Explain ACID properties. 4
11. (A) Explain the various failure classifications. 6
- (B) Explain the various aspects of Data Security. 4
- (C) What is checkpoint ? What happens at the time of checkpointing ? 4

OR

- ~~12.~~ Write a short notes on (any **THREE**) :— 14
- (i) Log Based Recovery
- (ii) Buffer Management
- (iii) SQL Databases
- (iv) Recovery and Atomicity.