B.E.(Computer Engineering) Sixth Semester (C.B.S.)

Database Management Systems

P. Pages : 2 **NRT/KS/19/3502**

Time : Three Hours * 0 7 6 6 * Max. Marks : 80

Notes : 1. All questions carry marks as indicated.
2. Solve Question 1 OR Questions No. 2.
3. Solve Question 3 OR Questions No. 4.
4. Solve Question 5 OR Questions No. 6.
5. Solve Question 7 OR Questions No. 8.
6. Solve Question 9 OR Questions No. 10.
7. Solve Question 11 OR Questions No. 12.
8. Illustrate your answers whenever necessary with the help of neat sketches.

1. a) Define DBA. List and explain the responsibilities of DBA. **6**

b) Describe the architecture of database management system in detail with neat sketch. Also explain the function of each component in detail. **8**

OR

2. a) Explain any five fundamental operations of relational algebra with suitable examples. **7**

b) What is database management system? Give the advantages of DBMS over conventional file system. **7**

3. a) Consider the following schema of a relational database – **10**
Customer (cust_name, cust_city, cust_street)
Branch (branch_name, branch_city, assets)
Account (branch_name, account_number, balance)
Depositor (cust_name, account_number)
Loan (branch_name, load_number, amount)
Borrower (cust_name, loan_number)
write the SQL queries for
i) Find the names of the customers pertaining to loans more than Rs. 12,000/- made at perryridge branch
ii) Find the names of all branches with customers who have an account in the bank and who line in Harrison.
iii) Find the customers of the bank who have an account but no loan.
iv) Find the names of all customers whose street address includes the substring “Main”
v) Find all the customers in alphabetic order who have a loan at the perryridge branch.

b) What is the ‘view’? How it is created in SQL? **3**

OR

4. a) What are different aggregate functions used in SQL? Explain each with proper example. **6**

b) Explain different types of Join and Natural Join operations in SQL with suitable example. **7**

5. a) Compute canonical cover F_c for **6**
R = (A, B, C, D, E) and
$F = \{A \rightarrow BC$
$CD \rightarrow E$
$B \rightarrow D$
$E \rightarrow A\}$
List candidate keys for R.

b) Explain extended features of E – R diagram. **7**

OR

6. a) Consider the relational schema **7**
R(A, B, C, D, E, F, G)
with the dependencies
$F = \{AB \rightarrow CD, D \rightarrow E \text{ and } C \rightarrow FG\}$
i) Find prime and non-prime attributes.
ii) Find the highest normal form of the relation.

b) Explain normalization using multivalued dependencies. **3**

c) Show that if relational schema is in BCNF then it is also in 3NF using suitable example. **3**

7. a) What is query optimization? Give various techniques of query optimization & explain it briefly. **7**

b) What are various measures of estimating query cost? **6**

OR

8. a) Explain transformation of relational expression with respect of query processing. **6**

b) Write short notes on **7**
i) Materialized view. ii) Choice of evaluation plan.

9. a) What is a transaction? Explain various properties of transaction. **6**

b) What is deadlock? How is deadlock detection and recovery achieved in DBMS? **7**

OR

10. Write short notes on **any three**. **13**
i) Time stamp based protocol. ii) Serializability.
iii) Two – phase locking protocol. iv) Log based recovery.

11. a) Define distributed databases. How distributed data storage is performed? **7**

b) Explain security and protection mechanism of distributed databases. **7**

OR

12. a) Explain the concept of distributed commitment and recovery. **7**

b) Explain the concept of homogeneous and heterogeneous systems in detail. **7**

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