B.E. (Computer Science & Engineering) Semester Fifth (C.B.S.)

Database Management System

P. Pages : 3 **KNT/KW/16/7351**

Time : Three Hours * 0 6 5 7 * 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. Assume suitable data whenever necessary.
10. Illustrate your answers whenever necessary with the help of neat sketches.

1. a) What are different roles played by DBA? Also give various database users. **5**

b) Consider the following relational database **6**
SALESPERSON (Name, Percent_of_Quota, Salary)
ORDER (Number, Custname, Salespersonname, amount)
CUSTOMER (Name, City, Industrytype)
For each of the query given below, give expression in SQL.

i) Find the names and quota percentages of salespeople who have an order with ASIAN CONSTRUCTION in descending order of quota percentage.

ii) Find the quota percentage of salespeople who have an order with a customer in MUMBAI.

iii) Find the names of salespeople who have two or more orders.

iv) Find the names of salespeople who have an order with all customers.

c) Define. **3**

i) Attribute

ii) Entity

iii) Entity set

OR

2. a) Draw & Explain E-R diagram for college Management system. **6**

b) What are various approaches to build a database. **4**

c) Explain the various database data models. **4**

3. a) Consider the following relation schema:- **6**
Author (A Name, Inst, A city, age)
Publisher (Pname, Pcity
Book (Title, Aname , Pname)
Express the following query using relational algebra operations.

i) Find the name of all publisher.

ii) Find the values of all attributes of all author who have published a book for the publisher with pname = "Technical Publisher".

iii) Find the name of all authors who have published a book for any publisher located in calcutta.

b) Differentiate between strong and weak entity set. **3**

c) Discuss primary key and Foreign key. **4**

OR

4. a) Explain specialization and Generalization. **5**

b) What do you mean by referential Integrity? How it is achieved in SQL? **5**

c) Differentiate between schema and instance. **3**

5. a) Define indexing? Explain various index evaluation metrics? **5**

b) Define Normalization? Explain 1NF, 2NF & 3NF, 4 NF with example. **8**

OR

6. a) Differentiate Hashing and indexing. Also discuss open and closed hashing . **5**

b) Differentiate B tree and B^+ tree. why B^+ tree is usually preferred over B tree? construct B^+ tree for the following set of key values 1, 4, 7, 10, 17, 21, 31, 25, 19, 20, 28, 42 having n=4 **8**

7. a) Let Relation R_1 (A,B,C) & R_2 (C,D,E) have following properties. **8**
R_1 has 10,000 tuples and R_2 has 15,000 tuples where
20 tuples of R_1 on one block and
15 tuples of R_2 on one block.
Estimate no. of block access required using each of the following join strategies of R_1 & R_2 :-

a) Merge Join

b) Hash Join

c) Block Nested Loop Join

d) Nested Loop Join.

b) What is query optimization? Give various techniques of query optimization. **6**

OR

8. a) What is query processing? Explain steps involved in query processing. **5**

b) What is meant by materialization? Explain it with the help of example. **5**

c) Write a note on pipelining. **4**

9. a) What is serializability? Explain conflict & view Serializability. **8**

b) Define transaction. Explain ACID properties of Transection. **5**

OR

10. a) Explain a different concurrency problems and give solution for it. **6**

b) What is two phase locking? How does it guarantee serializability? **7**

11. a) What is log based recovery technique? **4**

b) Describe different types of failure that occurs in the system? How are they recovered? **9**

OR

12. a) Write a note on following **any three.**

i) Shadow paging. **4**

ii) Distributed database. **4**

iii) Aries recovery Algorithm. **4**

iv) Data warehousing. **4**

v) Data mining. **5**

****