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

Database Management System

P. Pages : 3 **NRT/KS/19/3435**

Time : Three Hours * 0 1 4 0 * 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. Due credit will be given to neatness and adequate dimensions.
9. Illustrate your answers whenever necessary with the help of neat sketches.

1. a) Describe the overall architecture of DBMS with neat diagram. **6**

b) What are different database Languages. **3**

c) Consider the following schema & answer the following SQL quires. Teacher (Tid, Tname Cid, City, Sal, Subject) **5**

1) Find the name of teachers who lives in 'Nagpur' and salary is greater than '15,000/-'
2) Find all teacher's who teacher 'DBMS'
3) Find the subject name whose name ends with char 's'.
4) Update the teacher city from 'Nagpur' to 'Pure' whose id is 5.
5) Find all the teachers salary in descending order.

OR

2. a) Draw & explain E-R diagram for online shopping. **6**

b) Discuss the concept of Generalization & specialization. **4**

c) Explain the various database data models with neat diagram. **4**

3. a) Discuss different types of keys in DBMS with example. **5**

b) Describe any four relational algebra operator with example. **8**

OR

4. a) Let the following relational schema is given as R(A,B,C) and S(D,E,F). Give an expression in SQL that is equivalent to following query. **6**

a) $\pi c\left(\sigma B = 20(R)\right)$ b) $R \times S$

c) $\pi B(R)$ d) $\sigma B = 12\ (R)$

e) $R \cup S$ f) $R \cap S$

b) What is relational calculus? Explain domain & tuple relational calculus. **5**

c) Differentiate between schema & Instance. **2**

5. a) Define functional dependency. Explain the rules of interference or Armstrong Axioms' with supporting rule. **7**

b) Compute the closure of the following set F of FD's for relation R = (A, B, C, D, E) where **6**

$\{ A \rightarrow BC$

$CD \rightarrow E$

$B \rightarrow D$

$E \rightarrow A$

$\}$

List all the candidate key of R.

OR

6. a) Construct B^+ tree for the following set of key value {1, 4, 7, 10, 17, 21, 31, 25, 19, 20, 28, 42} having n = 4 & n = 6. **6**

b) What do you mean by primary & secondary indexing? Also explain the difference between sparse & dense index. **7**

7. a) Explain the different phases involved in query processing. **6**

b) What do you mean by materialization? How pipelining overcome materialization. **4**

c) Explain the function of query evaluation plan with example. **3**

OR

8. a) What is query optimization? Give various technique of query optimization. **5**

b) Solve the following **any four.** **8**

1) Indexed nested loop join.

2) Cost based optimization.

3) Heuristic optimization

4) Sorted Merge Join.

5) Block nested loop join.

6) Hach Join.

9. a) Define transaction. What are the different states of transaction? Give ACID properties of transaction. **7**

b) What is serializability? Explain conflict & view serializability. **6**

OR

10. a) Explain 2 phase commit protocol in detail. **6**

b) State the reason for the occurrence of deadlock. Suggest its prevention method. **5**

c) Check for conflict serializability **2**

T_1	T_2	T_3
R(x)		
	R(z)	
R(z)		R(x)
		R(y)
		W(x)
	R(y)	
	W(z)	
	W(y)	

11. Write short note on **any five.** **14**

1) ARIES Recovery Algorithm.

2) Check points

3) Datamining.

4) Data warehousing

5) Web databases.

6) Distributed databases.

OR

12. a) Describe different types of failures that occurs in the system? How they are recovered. **7**

b) Explain the Log based Recovery algorithm in detail. **7**

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