

Exam Number: _____

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Subject Name : Database Management Systems

Subject Code: CT306-N

Date: 22/12/2023(Friday) Time: 12.00 pm to 03.00 pm

Total marks: 70

Instructions:

1. Answer each section in separate Answer sheet.
2. All questions are compulsory.
3. Indicate clearly, the options you attempt along with its respective question number.
4. Use the last page of main supplementary for rough work.

Section-I

- Q.1(A) What is DBMS? Discuss the applications of DBMS. (5)
- Q.1(B) Define E-R diagram. Draw an E-R diagram for Hospital Management System. Assume relevant entities and attributes for the given system. (5)
- Q.1(C) Explain following relational algebra operations with Example. (5)
- (i) Selection and Projection
- (ii) Natural join

OR

- Q.1(C) What is DDL? Explain all the commands of DDL in detail. (5)
- Q.2(A) Explain the following terms. (5)
1. Attribute
2. Entity
3. Participation Constraints
4. Weak Entity Sets
5. Mapping Cardinalities
- Q.2(B) Explain Aggregate functions with example. (5)

OR

- Q.2(A) Explain Types of attributes in detail. (5)
- Q.2(B) Consider following schema and write SQL for given statements. (5)
- EMP (empno, ename, jobtitle, managerno, hiredate, sal, commission, deptno)
- DEPT (deptno, dname, location)
- (a) Find the Employees working in the department number 10, 20, 30 only.
- (b) Find Employees along with their department name.
- (c) Find Employees whose names start with letter A or letter a.
- (d) Display employees who are getting maximum salary in each department.
- (e) Find the Employees who get salary more than Allen's salary

- Q.3 (A) Explain Armstrong's Axioms in detail. (5)
- (B) What is functional dependency? Explain lossless decomposition. (5)

OR

- Q.3 (A) What is normalization? What is the need for normalization? Explain any two normal forms with suitable example(s). (5)
- (B) Given FD's for relation R {A, B, C, D, E, F}. Find closure of FD sets by applying Armstrong axioms? (5)
- $A \rightarrow B, A \rightarrow C, CD \rightarrow E, CD \rightarrow F, B \rightarrow E$

Section-II

- Q.4 (A) What is DCL? Also explain Grant and Revoke commands in detail. (5)
- (B) Explain steps of query processing with the help of a neat diagram. (5)
- (C) Explain query evaluation process using Cost based and rule (heuristic) based approach. (5)

OR

- (C) What is Database Index? Explain Primary Index with its types. (5)
- Q.5 (A) Explain B-tree in detail with appropriate example. (5)
- (B) What is TCL? List and Explain Commands of TCL (Transaction Control Language). (5)

OR

- Q.5 (A) What is Hashing? Explain dynamic Hashing in Detail. (5)
- (B) What is a Transaction? Explain the States of the transaction with a neat sketch. (5)
- Q.6 (A) Explain the concept of ACID properties in DBMS? (5)
- (B) List different access control methods and explain any one in detail. (5)

OR

- Q.6 (A) Define data warehouse. List the advantages of data warehouse. (5)
- (B) Explain Database recovery and Log based recovery. (5)
