62459

Reg. No. ☐☐☐☐☐☐☐☐

II Semester MCA Degree Examination December- 2024
COMPUTER SCIENCE
Data Base Management System
(CBCS Scheme Non NEP Y2K20)
Paper : 2 MCA 2

Time : 3 Hours   Maximum Marks : 70

Instruction to Candidates:

    1)   **Answer All Sections.**

    2)   **Answer anyFive questions from Section - A, each carries Six marks.**

    3)   **Answer any Four questions from Section - B, each carries Ten marks.**

SECTION - A

I.   **Answer any Five of the following questions. Each carries 6 marks.**   (5×6=30)

    1.   What is database instance? Explain advantages and disadvantages of DBMS.

    2.   Define data model? Discuss different types of data model with examples.

    3.   What is an attribute? Describe different types of attributes with examples.

    4.   Illustrate Hash index and Bit map index.

    5.   Write a note on outer join and its types in relational algebra with examples.

    6.   Consider a schema S= (U, V, W, X, Y, Z) on which the following functional dependencies hold {U->V, VW->X, Y->W, X->U}. Find how many no. of candidate keys in S.

    7.   Define the term transaction. Demonstrate different states of transaction with a neat diagram.

    8.   Explain validation concurrency control protocol with an example.

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SECTION-B

II. **Answer any Four full questions.** (4×10=40)

9. a) What is data independence ? Write short notes on types of data independence.

b) Explain roles and responsibilities of DBA.

10. a) Explain hashing techniques with examples.

b) Draw an E-R diagram for Bank database with four entities having six attributes each.

11. a) Explain division operator and cartesian product operator with a suitable example.

b) Discuss the following keys with an appropriate example.

   i) Candidate key

   ii) Primary key

   iii) Foreign key

12. a) Briefly explain any five aggregate functions in SQL with examples.

b) Explain fourth normal form and fifth normal form with table example

13. Consider the following schema and answer the queries.

EMPLOYEE

NAME	VARCHAR (30)	NOT NULL,
EID	VARCHAR (10)	NOT NULL,
DEPTNO	INT (5)	NOT NULL,
HODEID	VARCHAR (10),	
SALARY	INT (10),	

PRIMARY KEY (EID),

FOREIGN KEY (HODEID) REFERENCES EMPLOYEE (EID),

FOREIGN KEY (DEPTNO) REFERENCES DEPARTMENT (DID);

DEPARTMENT

DID	INT (5)	NOT NULL,
DNAME	VARCHAR (30)	NOT NULL,
HODID	VARCHAR (10)	NOT NULL,
HODNAME	VARCHAR (30),	

PRIMARY KEY (DID),

UNIQUE (DNAME)

FOREIGN KEY (HODID) REFERENCES EMPLOYEE (EID);

PROJECT WORK

EMPID	VARCHAR (10)	NOT NULL,
PROJNO	INT (5)	NOT NULL,
PROJECTLOC	VARCHAR (30)	NOT NULL,

PRIMARY KEY (EMPID, PROJNO),

FOREIGN KEY (EMPID) REFERENCES EMPLOYEE (EID);

a)   Retrieve the distinct employee ID (EMPID) of all employees of university who are working on project No.20. 30 and 40.

b)   To find the sum of salaries of all employees of the English department as well as the maximum, minimum and average salary in English department.

c)   Return the employee ID and name of employees whose salary is greater than the salary of all employees in department number 20 of university. Order result by employee ID

d)   Drop the 'SALARY column from 'EMPLOYEE' table.

e)   Write a query for this scenario that University decided to give all employees in the 'SCIENCE' department a 20% rise in salary.

14.   a)   Explain time stamp ordering protocol with example

b)   Explain database backup and recovery from catastrophic failures

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