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II Semester M.C.A. Degree Examination, December - 2023

COMPUTER SCIENCE

Database Management Systems

(CBCS-Y2K20 Scheme)

Paper : 2MCA2

Time : 3 Hours

Maximum Marks : 70

Instructions to Candidates:

1. Answer All the Sections.
2. Answer any Five questions from Section - A
3. Answer any Four questions from Section -B.



SECTION -A

Answer any Five questions. Each question carries 6 marks.

(5×6=30)

1. Explain the characteristics of the database approach.
2. What is relational schema and relational instance? Give one example of each
3. What is an attribute? Explain the different types of attributes with an example.
4. Draw an ER diagram for the Bank database with four entities having six attributes each.
5. Write a note on different types of indexes.
6. Explain with illustration UNION, INTERSECTION and SET DIFFERENCE operations in relational algebra.
7. What are different types of constraints in SQL? Explain with illustration.
8. Explain two-phase locking with an example.

SECTION -B

Answer any Four questions . Each question carries 10 marks.

(4×10=40)

- 9 a) Explain the three-schema architecture with a neat diagram. (6)
- b) What do you mean by actors on the scene and workers behind the scene? Explain. (4)

I.P.T.O.



- 10 a) Define the following terms with example: (6)
- i) Domain
 - ii) Cardinality
 - iii) Foreign key

b) Explain the different types of joins in relational algebra. (4)

11. Given the relation and the functional dependencies, normalize upto first two normal forms (FNF and 2NF) (10)

EMP_PROJ (ssn, empname, bdate, dept_no, proj_id, proj_name, proj_hrs)

Functional Dependencies:

{ssn} → {empname, bdate, dept_no, proj_id}

{proj_id} → {proj_name}

{proj_id, ssn} → {proj_hrs}

Please Note: Each employee can work on more than one project. He works for a specific number of hours on each project.

12. a) Explain any five aggregate functions in SQL with an example. (5)

b) What are views? Give advantages and disadvantages of views. (5)

- 13 a) Given the Library Database: (5)

Student (usn, name, address)

Book(book_id, bookname, author_id, publisher)

Author (author_id, authorname, country)

Borrow(usn, book_id, borrowed_date)

Answer the following:

i. Display the student name along with names of the books borrowed by them.

ii. Add the column email_id for the Student table.

iii. List the books that have not been borrowed at all.

iv. Display the number of books published by each author.

v. Display the number of books issued by each student.

b) What is a transaction? Explain ACID properties of transaction. (5)

14. a) Explain Log based recovery techniques. (5+5)

b) Write a note on embedded SQL.