

[Total No. of Questions - 9] [Total No. of Printed Pages - 3]
(2064)

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MCA 3rd Semester Examination
Data Base Management System (N.S.)
MCA-301

Time : 3 Hours

Max. Marks : 60

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.

Note : Candidate is required to attempt five questions in all selecting one question from each of the section A, B, C, D of the question paper and all the subparts of the questions in E section. Section E is compulsory.

SECTION - A

1. (a) What are the advantages of relational model over other two data models in a DBS? How is relational model implemented? (Answer to the point) (8)
- (b) Define in-way B-tree. Where do we use a B-tree. (4)
2. (a) Draw an ER diagram for the following scheme:
Supplier (S#, Sname, Scity)
Part (P#, Pname, Pcolor)
Project (PR#, PRname, PRcity)
SPP (S#, P#, PR#, Amount)
Symbols have usual meaning. (8)
- (b) Give an example of index sequential file. (4)

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SECTION - B

3. (a) What do you mean by free, bound variables and well formed formula in tuple oriented relational calculus? Give an example of each.
- (b) Let $f_1(x)$ and $f_2(y)$ be two well formed formulas with free variables x and y respectively.

Whether the following is valid or invalid expression justify

$$\exists x(f_1(x)) \text{ AND } \exists y(f_2(y))$$

$$\equiv \exists x \exists y (f_1(x) \text{ AND } f_2(y)) \quad (6+6=12)$$

4. Study the following scheme and write the SQL statements for the queries given below:

S (S#, Sname, Scity, DoB)

(DoB is date & birth)

CC#, Cname, Cyear, number 1 number indicates the number of students. SC (S#, C#)

- (a) Give the number of students studying in second year of 'Computer Science' class.
- (b) Give the names of the students who have joined the courses from city = 'xyz'.
- (c) Give the total number of students studying in first year. (4×3=12)

SECTION - C

5. What are the three problems which are handled by concurrency control mechanism? Explain each briefly. (12)
6. Explain locking technique for concurrency control. (12)

SECTION - D

7. What are the main objectives of DDBS? (12)
8. Explain to the point the client/server system. (12)

SECTION - E

9. (a) What are the advantages of DBS? (2)
- (b) Define various types of join operations in a DBS. (3)
- (c) Define functional dependency. Give the functional dependency (ies) from the following table. (3)

X	Y	Z
10	50	90
20	60	100
30	70	90
40	80	110

- (d) What are the advantages of Network data model? (2)
- (e) In relational algebra give examples of SELECT and PROJECT operations. (2)