

[Total No. of Questions - 9] [Total No. of Printed Pages - 3]  
(2124)

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**MCA 3rd Semester Examination**  
**Data Base Management System (NS)**  
**MCA-301**

**Time : 3 Hours**

**Max. Marks : 60**

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

**Note :** Attempt five questions in all selecting one question each from section A, B, C, and D. Section E is compulsory.

**SECTION - A**

- 1 (a) Describe different Data Base Schemes in detail and also explain the difference between physical and logical Data Independence. (6)
- (b) Describe the five components of DBMS environment and discuss how they relate to each other. (6)
2. Generate an E-R diagram for Bank enterprise which has following major characteristics:
  - (i) The bank is organized into branches, located in a city and has a unique name. It monitors the Asset value.
  - (ii) Bank customers are identified by their customer-id values. Customers have accounts and take out loan. He/She is associated with a particular Banker, who may act as a loan officer or Personal Banker for that customer.
  - (iii) Bank employees are identified by their employee-id values. The bank also keeps packs of the employee's start date and thus length of employment.

**[P.T.O.]**

- (iv) The Bank offers two account saving and Banking account. Account can be held by more than one customer and a customer has more than one account.
- (v) A loan is originated at a particular branch and can be held by one or more customers. The Data and Time are recorded for each payment. (12)

### SECTION - B

3. (a) Explain the approach used for designing Relational data base (6)
- (b) Explain the reasons of anomaly in a database. (6)
4. Suppose that we have a relation marks (student-id, score) and we wish to assign grades to students based on the score as follows: grade F if score < 40, grade C if 40 < score < 60, grade B if 60 < score < 80, and grade A if 80 < score. Write SQL queries to do the following:
- (i) Display the grade for each student, based on the marks relation.
- (ii) Find the number of students with each grade.
- (iii) Display the name of the students getting A grades.
- (iv) Display the number of students getting grades A, B, and F. (12)

### SECTION - C

5. What do you mean by serializability? Discuss the conflict and view serializability with suitable example. Discuss the testing of serializability also. (12)
6. What is optimistic scheduling? What is Recoverable schedule? Why is recoverability of schedule desirable? Are there any circumstances, under which it would be desirable to allow non-recoverable schedule? (12)

### SECTION - D

7. (a) Write correctness rules of fragmentation in DDBMS (6)
- (b) Give an overview of three tier client architecture (6)
8. (a) When do you derive horizontal fragmentation in Distributed relational Database Design? (6)
- (b) What problems do occur if we do not handle control concurrency in DDBMS? (6)

### SECTION - E

9. Write short notes on the following in context of DBMS/DDBMS:
- (a) Data integration.
- (b) Direct Files.
- (c) Indexing using tree structure.
- (d) Universal relation.
- (e) Triggers.
- (f) SQL.
- (g) Multiversion.
- (h) Security and integrity.
- (i) Locking scheme.
- (j) Reliability.
- (k) Replication.
- (l) Recovery. (12×1=12)