[Total No. of Questions - 9] [Total No. of Printed Pages - 2]

Dec-24-0319 (NEP)

MCA-6102 (Database Management Systems)

MCA-1st CBCS/NEP

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: Attempt five questions in all, select one question each from section A, B, C, D. Section E (Question-9) is compulsory.

Section A

1. Explain the differences between a file-oriented system and a database-oriented system. (12)

OR

2. Discuss the main categories of data models. What are the basic differences among the relational model, the object model, and the XML model? (12)

Section B

3. Describe the four clauses in the syntax of a simple SQL retrieval query. Show what type of constructs can be specified in each of the clauses. Which are required and which are optional? (12)

OR

4. Define the following terms with respect to the tuple calculus: *tuple variable, range relation, atom, formula,* and *expression.* (12)

Section C

5. Draw a state diagram and discuss the typical states that a transaction goes through during execution. (12)

OR

6. Describe the four levels of isolation in SQL. Also, discuss the concept of snapshot isolation and its effect on the phantom record problem. (12)

Section D

7. What are the main reasons for and potential advantages of distributed databases? (12)

OR

8. Write a technical note on:

   a) Client-server architectures

   b) Multimedia databases and deductive databases (12)

Section E (Compulsory)

9. a) Discuss advantages of DBMS.

   b) Why are duplicate tuples not allowed in a relation?

   c) What is meant by a *safe expression* in relational calculus?

   d) What is meant by the concurrent execution of database transactions in a multiuser system?

   e) What is a timestamp?

   f) What is the two-phase locking protocol? (6×2=12)