

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

Dec-24-0336 (CBCS)

CS-401 (Database Management System) [CSE, IT]

B.Tech. 4th

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, selecting one question each from Section A, B, C, & D. Section-E is compulsory.

### SECTION - A

1. What do you mean by Schema, Instances and State of database and data independence (Logical and Physical data independence)? Explain three level-Schema (ANSI SPARC) Architecture with mapping. (10)
2. What is the procedure to convert ER model into relational model? Draw ER diagram for Hospital Management System (Use DOCTOR, PATIENT, HOSPITAL and MEDICAL\_RECORD Entity). Identify Primary Key and Foreign Key. (10)

### SECTION - B

3. What do you mean by DDL, DML, DCL & TCL statements in SQL? Explain group by and having clause SQL statements with example. (10)
4. What do you mean by relational algebra? Explain difference and division operation with example. (10)

### SECTION - C

5. Why is normalization required to reduce anomalies in DBMS? How is BCNF better than third normal forms? Explain with suitable example. (10)

6. What is query processing and optimization in DBMS? Explain in detail. (10)

### SECTION - D

7. What is transaction management and concurrency control in DBMS? Explain the various techniques in details. (10)
8. What are the three types of recovery techniques? Explain in detail. (10)

### SECTION - E (Compulsory)

9. Answer the following questions:

- A. What is a data, information and records?
- B. What are limitations of file-based approach?
- C. What is logical data independence?
- D. What are domain constraints?
- E. What do you mean by data inconsistency?
- F. What is foreign key?
- G. What is cost based optimization?
- H. How can concurrency control be done by time stamp method?
- I. What do you mean by 5NF?
- J. What are triggers? (10×2=20)