Registration No.: | | | | | | | | | | |

Total Number of Pages: 02

Course: B.Tech
Sub_Code: RCS5C002

5th Semester Back Examination: 2025-26
SUBJECT: Database Management Systems
BRANCH(S): CSE, CSEAI, CSEAIML, CSEDS, CSIT, CST, IT
Time: 3 Hours
Max Marks: 100
Q.Code: U218
Answer Q1 (Part-I) which is compulsory, any eight from Part-II and any two from Part-III.
The figures in the right-hand margin indicate marks.

Part-I

Q1 **Answer the following questions:** **(2 x 10)**

a) Differentiate between schema and instances?
b) Explain the difference between physical and logical data independence?
c) Explain the distinctions among the terms primary key, candidate key, and super key?
d) List two reasons why we may choose to define a view?
e) List the three design goals for relational databases, and explain why each is desirable?
f) What is a transaction? In what ways is it different from an ordinary program (in a language such as C)?
g) Give an example of a strict schedule that is not serializable?
h) Why are some functional dependencies called trivial?
i) Define query processing?
j) Why you need concurrency control?

Part-II

Q2 **Only Focused-Short Answer Type Questions- (Answer Any Eight out of Twelve)** **(6 x 8)**

a) Define functional dependency (FD)? Explain using a suitable example.
b) Define data model. Mention the various categories of Data Model?
c) What is an unsafe query? Give an example and explain why it is important to disallow such queries.
d) What do you mean by Object-relational data model? Explain with example.
e) What do you mean by semi join? Explain with example.
f) What is an entity? Explain the different types of entities.
g) What is update anomalies? Explain with example.
h) What is tuple calculus? Define tuple variables and well-formed formulas
i) Explain the three-tier architecture of DBMS.
j) Explain QBE with example
k) What does the term redundancy mean? Discuss the implications of redundancy in a relational database.
l) Explain why 4NF is a normal form more desirable than BCNF?

Part-III

Only Long Answer Type Questions (Answer Any Two out of Four)

Q3 **a)** Define (I) primary key and (II) foreign key. Suppose relation R (A, B, C, D, E) has functional dependencies: **(8)**

AB → C
D → A
AE → B
CD → E
BE → D

Find all the candidate keys of R.

b) Explain the database recovery technique based on deferred update. **(8)**

Q4 **a)** List five responsibilities of a database management system. For each responsibility, explain the problems that would arise if the responsibility were not discharged. **(8)**

b) Construct an E-R diagram for a hospital with a set of patients and a set of medical doctors. Associate with each patient a log of the various tests and examinations conducted. **(8)**

Q5 **a)** Explain with example the following SQL commands: **(8)**

I. CREATE – both view and table
II. ALTER – both *add and* modify
III. SELECT – group by, having apart from FROM and WHERE.

b) Discuss about (any two) **(8)**

I. Normalization
II. OLAP
III. Object-oriented database.

Q6 **a)** When a transaction is rolled back under timestamp ordering, it is assigned a new timestamp. Why can it not simply keep its old timestamp? **(8)**

b) Database-system implementers have paid much more attention to the ACID properties than have file-system implementers. Why might this be the case? **(8)**