

2021
B.E. (Computer Science and Engineering)
Third Semester
CS-302: Database Systems

Time allowed: 3 Hours

Max. Marks: 50

NOTE: Attempt five questions in all, including Question No. 1 which is compulsory and selecting two questions from each Unit.

x-x-x

I. Answer the following:-

- a) Differentiate between logical and physical data independence.
- b) What do you understand by a weak entity in ER modelling? Give an example.
- c) What is the purpose of a foreign key? Discuss in brief.
- d) List two advantages of using timestamp based concurrency control protocols.
- e) What is the purpose of a firewall? Discuss in brief. (5x2)

UNIT – I

- II. a) What are the advantages of a DBMS over traditional file processing system? Discuss.
- b) Draw and explain ER diagrams for a Library Management System. Appropriately assume any required information yourself. (2x5)

III. Differentiate between:-

- a) Fixed length records and variable length records
- b) Derived attributes and composite attributes
- c) Relational Algebra and Relational Calculus
- d) Tables and Views
- e) Sparse index and dense index (5x2)

IV. a) Explain the syntax and usage of following SQL statements with the help of suitable examples: INSERT, UPDATE, DELETE

b) Explain the syntax and usage of following relational algebraic operations with the help of suitable examples: SELECT, PROJECT, RENAME (2x5)

UNIT – II

V. a) Give an example of a table that is in 2NF but not in 3NF. Then decompose that table into 3NF. Appropriately assume any required information yourself.

(2)

b) What do you understand by Dirty Read problem? Discuss with the help of an example. (2x5)

VI. a) Discuss the deferred update technique of recovery. What are the advantages and disadvantages of this technique?

b) Explain Two-phase locking protocol and discuss its advantages. (2x5)

VII. Explain the following:-

a) Bell-LaPadula Model

b) Shadow Paging Technique (2x5)

x-x-x