



10CS54

Fifth Semester B.E. Degree Examination, July/August 2022
Database Management Systems

Time: 3 hrs.

Max. Marks:100

Note: Answer any FIVE full questions, selecting atleast TWO questions from each part.

PART – A

- 1 a. Discuss the main characteristics of the database approach. How does it differ from traditional file systems? (10 Marks)
b. Describe the three scheme architecture with block diagrams. Why do we need mapping between scheme levels? (10 Marks)
- 2 a. Write the ER diagram for an employee database. The constraints are as follows:
i) An employee works for a department
ii) Every department is headed by a manager
iii) An employee works on one or more projects
iv) An employee has dependents
v) A department controls the projects. (12 Marks)
b. List the summary of the notations for E-R diagram and their meanings. (08 Marks)
- 3 a. Write the relational algebra operations to perform the following queries:
i) Retrieve the name and address of all employees who work for the 'Research' department.
ii) List the names of managers who have at least one dependent.
iii) Find the names of employees who work on all the projects controlled by department number 5. (12 Marks)
b. Explain the relational algebra operations from set theory, with examples. (08 Marks)
- 4 a. Consider the following schema and write the SQL Queries:
EMP (SSN, NAME, ADDR, SALARY, SEX, DNo)
DEP (DNo, DNAME, MGRSSN)
DEP_LOCN (DNo, DLOCN)
PROJ (PNo, PNAME, PLOCN, DNo)
WORKSON (SSN, PNo, NoHRS)
DEPENDENT (SSN, DEPNTNAME, DEPNTSEX, DEPNTRELATIONSHIP)
i) Retrieve the names of all employees who have no dependents.
ii) List the names of each employee who works on all the projects controlled by department No. 5.
iii) Retrieve the social security numbers of all employees who work on project numbers 1, 2, 3 or 4.
iv) Retrieve the total number of employees and the number of employees in the 'Research' department.
v) For each project, retrieve the project number, the project name, the number of employees who work on that project. (12 Marks)
b. Explain the different constraints that can be applied during table creation in SQL, with a suitable example. (08 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and/or equations written eg, 42+8 = 50, will be treated as malpractice.

PART - B

- 5 a. How is view created and dropped? What problems are associated with updating views? (08 Marks)
b. How are triggers and assertions defined in SQL? Explain. (08 Marks)
c. List the differences between independent nested and co-related nested query. (04 Marks)
- 6 a. Define the 1NF, 2NF and 3NF with a suitable example for each. (12 Marks)
b. Discuss insertion, deletion and modification anomalies. Illustrate with examples. (08 Marks)
- 7 a. Write the algorithm for testing non-additive join property. (10 Marks)
b. Explain the 4NF with a suitable example. (10 Marks)
- 8 a. What are ACID properties? Explain. (04 Marks)
b. What is a schedule? Explain with example conflict serializable schedule. (08 Marks)
c. Explain the three phases of the ARIES recovery model. (08 Marks)

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