Roll No									

राष्ट्रीय प्रौधोगिकी संस्थान गोवा

NATIONAL INSTITUTE OF TECHNOLOGY GOA

Farmagudi, Ponda, Goa, 403401

Programme Name: B.Tech

Mid Semester Online Examinations, October 2021

Course Name: Database Systems — Course Code: CS301

Date: 05-10-2021 — Time:10.00 AM- 11.30 AM

Duration: 1 Hour 30 Minutes — Max. Marks: 50

ANSWER ALL QUESTIONS

1 a. Discuss the different characteristics of a database systems.

b. Define database management system with necessary four parameters. Also discuss any three database systems with necessary example.

c. Discuss the component model of a database management system with necessary block diagram

(4+3+3)

2a. What is database Model? Explain any three database models with necessary example.

b. Define the following keys with suitable example:

i. Super Key ii. Candidate Key ii. Primary Key iv. Foreign Key

c. Explain the basic operations of a relational algebra. (4+4+2)

3a. Give the mathematical expression of a division operation of a relational algebra. Also give necessary example with suitable database (Write the database that you considered).

b. What is a schema? Explain the three schema architecture of a database with necessary block diagram

c. What are the roles of database administrator and system analysts? (4+4+2)

4a. What are the different aggregate operations of a relational operation? Explain ach with necessary example.

b. Explain the query processing system with necessary block diagram.

c. Explain how natural join and theta join operations are different from different outer join operations. (4+3+3)

5. Consider the following relational schema

EMPLOYEE (person_name, street, city)
WORKS (person_name, company_name, salary)
COMPANY (company_name, city)
MANAGES (person_name, manager_name)

Give the relational algebra queries for the following statements:

a. Find the names, street addresses, and cities of residence of all employees who work for SS_Solutions and who earn more than Rs 15,00,000 per annum.

b. Find the names and cities of residence of all employees who work for SS_Solutions.

c. Find all employees in the database who do not work for SS_Solutions.

d. Find all employees who live in the same city as that in which the company for which they work is located. (4x2.5=10)

----------ALL THE BEST----------