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B.Sc. (Gen) Mathematical Science/III
Computer Science
Paper V
Database Management System

E

Time: 3 Hours
Note: All the questions are compulsory.

M.M:38

Q1.Define the following terms:
(i) Data Inconsistency (ii) Functional dependency

(2x2)

Q2.Explain the different steps of database design.

(4)

Q3. Explain the Entity-Relationship Model in detail. What is the degree of a Relation and degree of a relationship?

(5)

Q4. A university registrar's office maintains data about the following entities
        (a) course(course_number, title, stream, minimum_eligibility)
        (b) course_offering (student_id, course_number, year, semester)
        (c) student (student-id, name, address, contact_no)
        (d) instructor(instructor-id, name, department)
        (e) instructor_course(instructor_id,course_no)

A student can enroll in a single course only. An instructor can teach maximum in three courses. Draw an E-R diagram for the registrar's office. Mention all assumptions that you make about the mapping constraints.

(6)

Q5. Discuss the entity integrity and referential integrity constraints. Why each is considered important?

(4)

Q6.Considering the following relational database, write the SQL DDL Statements with all desired and necessary constraints.
        employee(emp_no,emp_name,city,contact_no)
        works(emp_no, Project_name,salary)
        Project(Project_name,city,Project_head)
For the following queries, write the SQL query statements.
        (i)   List the names of the employees who live in the same city where they are working.
        (ii)   Find the details of all the employees who earn more than every employee working on "ABC Project"
        (iii)   Give the name of the projects where number of employees is >10
        (iv)   Update the database by increasing the salary of project heads by 10%.
Write the **Relational Algebra** query statement for the followings:
(i)Find the details of the employees who are working under project head "Anil Gupta".
(ii) Find the names of all the employees who do not work for "ABC Project".

(9)

Q7. Consider the following two sets of functional dependencies:

F= {A->C, AC->D, E->AD, E->H} and G= {A->CD, E->AH}

Check whether they are equivalent.

(6)