COURSE CODE: 10B11CI312

MAX. MARKS: 50

COURSE NAME: Database Systems

COURSE CREDITS: 4

MAX. TIME: 2 Hrs

Note: *All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means.*

Q1. What are the advantages of DBMS over traditional file-based systems? [6]

Q2. Illustrate the concept of Referential Integrity constraint with the help of an example. [6]

Q3. Draw and explain three-tier schema architecture of database systems. [6]

Q4. What is a complete set of relational operations? [4]

Q5. Differentiate between [14]
   i) Strong and Weak entity type
   ii) Primary key, candidate key and superkey
   iii) Total participation and partial participation constraint
   iv) Left outer join and right outer join

   With the help of examples.

Q6. A university registrar's office maintains data about the following entities: [6]
   • courses, including number, title, credits, syllabus, and prerequisites;
   • course offerings, including course number, year, semester, section number, instructor(s), timings, and classroom;
   • students, including student-id, name, and program; and
   • instructors, including identification number, name, department.

   Further, the enrollment of students in courses and grades awarded to students in each course they are enrolled for must be appropriately modeled. Construct an E-R diagram for the registrar's office. Document all assumptions that you make about the mapping constraints.

Q7. Consider the following relational database schema where the primary keys are underlined. [8]
   employee (emp_name, street, city)
   works (emp_name, company-name, salary)
   company (company-name, city)
   manages (emp_name, manager-name)
   Give an expression in the relational algebra to express each of the following queries:
   i) Find the name of all employees who work for the company "Platina Software".
   ii) Find the name and city of all employees who work for the company "Platina Software" and have salary more than $10,000.

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