LTI-201
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AUTUMN MID SEMESTER EXAMINATION-2022

School of Computer Engineering
Kalinga Institute of Industrial Technology, Deemed to be University
Database Management System
[CS-2004]

Time: 1 1/2 Hours **Full Mark: 20**

Answer any four Questions including Q.No.1 which is Compulsory.
The figures in the margin indicate full marks. Candidates are required to give theiranswers in their own words as far as practicable and all parts of a question should beanswered at one place only.

1. Answer all the questions. [1 x 5]

a) Let E1 and E2 are two strong entity sets in ER diagram. E1 contains some simple single valued attributes along with mobile no as multivalued attribute where as all the attributes defined for E2 are simple single valued attribute. If R1 and R2 are two relationships between E1 and E2 where R1 is one-to –many and R2 is many-to-many relationship set. Find the minimum number of tables required to represent E1, E2, R1 and R2 in the relational model?

b) Emp (eid, ename, salary, dno)
Dept (dno, dname, location)
Write the SQL statement to find employee names who work in departments located in 'BBS' and whose salary is greater than 50000.

c) Mention the SQL command for adding a CHECK constraint on multiple columns on Emp table by using ALTER command.

d) At the time of data manipulation, the database system first consults with the data dictionary - justify.

e) Explain the importance of logical designing before the physical designing of database.

2. Consider the following relational schema:

Student (sid, sname, mark, gender, age)

Course (cid, cname, faculty)

Enrol (sid, cid)

Write the relational algebra expressions for the following queries.

a. Retrieve the Cid enrolled by every male student whose age is more than 20. [1 mark]

b. Retrieve the Sid of female students who score more number than every male student who has enrolled in at least one course taught by Faculty 'A'. [2 Marks]

c. Retrieve the Sid of the students who are male and enrolled in all courses taught by faculty 'A' or who are female and enrolled in all courses taught by Faculty 'B'. [2 Marks]

3.

a. Explain the various limitations of file system and how database systems overcome these limitations. [3 Marks]

b. What is the requirement of a key? Discuss the various types of keys with suitable example. [2 Marks]

4. Consider the following relational schema:

Student (roll, name, mob, cgpa, city, age)

Faculty (fid, fname, doj, salary, specialization)

Teach (fid, roll, sem)

Domain (specialization, subject)

Primary keys are underlined. Solve the following queries using the relational calculus. [1 x 5]

a. Find the students whose cgpa>8.0 and staying at 'BBS'.

b. Find the faculty manes who are teacing in 4^{th} semester.

c. Find the faculty names who are teaching to the 'BBS' students.

d. Display the students' names and rolls who are taugt by all faculty members.

e. Find the faculty names who are teaching to the 'BBS' students and teaching 'DBMS' subject.

5.

a. There are different organizations available for which we are interested to store the unique orgid along with orgname and domain. Each organization is conducting one annual fest (unique festid, festname, budget and theme) in each session. Many people are coming to the annual fest. Each person has unique prid along with prname, age and contact(s). The people can be categorized as either Employee (with salary) or Student (with cgpa) or Staff (with working_hours). Employees are managing Students. Similarly, Staffs are managing Students. Each annual fest contains many events (identified by unique evid along with evname and category). The students are participating in one or more events. Similarly, many students are participating in an event. There are different students treated as event managers for different events. Each event contains different rewards. Each reward has a rewardname and prize. Each reward can be identified by rewardname once the event is known. Draw the entity-relationship diagram for the above system. Make necessary assumption. [3 Marks]

b. Convert the above ER diagram into relational schemas and specify primary and foreign keys. [2 Marks]

*** Best of Luck ***