

National Institute of Technology Calicut

Department of Computer Science and Engineering

CS3095D DATABASE MANAGEMENT SYSTEMS LABORATORY

S5 B Tech - Monsoon Semester 2021

CS3095D DBMS Lab- Buffer Lab Evaluation

Marks:10 (6+4)

Date: 09.11.2021

Topic (SQL Basic and SQL Advanced)

1) In relations r1 and r2, r1(A, B, C) contains 200 tuples and r2(C, D, E) contains 500 tuples. If A and C are their primary keys, what is the maximum size of the join $r1 \bowtie r2$? [Mark 0.5]

2) Consider the following relational schema.

Employees(Eno: integer, sname: string)

Products(productno: integer, cname: string)

Production(Eno: integer, productno: integer, Numprod: integer)

Which query needs to be used to find the names of all employees who produced more than 50 number of the product numbered 100 ? [Mark 1]

3) Given the relation stud(studId, name, sex) and enroll(studId, courseId) showing student and course taken information. If every course is taken by at least one male and at least one female student, then what will the following relational algebra expression show ? [Mark 0.5]

$$\prod_{courseId} \left(\left(\prod_{studId} (\sigma_{sex="male"}(stud)) \times \prod_{courseId} (enroll) \right) - enroll \right)$$

4) Consider the following relational database schema:

flightpassenger (pid, pname, pgender, pcity)

travelagency (aid, aname, acity)

flight (fid, fdate, time, src, dest)

bookingdetails (pid, aid, fid, fdate)

Which relational algebra query needs to be used to list passengers who do not have any bookings in any flights ? [Mark 1]

5) For relations A and B, A has 12 rows and 6 columns and B has 25 records and 4 columns.

Performing Cartesian product on A and B, what is the degree of the new relation T where $T = A \times B$?

[Mark 0.5]

6) Consider the following database schemas and the SQL query;

user1 (uhandle, name, city, profile)

user2 (uhandle1, uhandle2)

Msg (uhandle, txt, fromcity)

For the query given:

SELECT uhandle, profile, min(city) FROM user1 NATURAL JOIN msg GROUP BY uhandle, fromcity;

Which part is wrong with the query ? **[Mark 0.5]**

7) For relation R1(P, Q, R, S) with functional dependencies $F = R \rightarrow S, R \rightarrow P, Q \rightarrow R$. Find the candidate key of R1. **[Mark 0.5]**

8) For the table given below:

P	Q	R
x1	y1	z1
x1	y2	z2
x2	y3	z1
x2	y3	z1

Which of the following functional dependencies hold? **[Mark 0.5]**

(a) $R \rightarrow P, PQ \rightarrow R$

(b) $Q \rightarrow P, QR \rightarrow P, PR \rightarrow Q$

(c) $R \rightarrow Q, PQ \rightarrow R, Q \rightarrow R$

9) Consider the following relational database schema:

flightpassenger (pid, pname, pgender, pcity)

travelagency (aid, aname, acity)

flight (fid, fdate, time, src, dest)

bookingdetails (pid, aid, fid, fdate)

Which query needs to be used to get the details of flights that are scheduled on either of the dates 03/11/2021 or 05/11/2021 or both at 16:00 hours ? **[Mark 1]**