

Name _____

Roll No. _____

Question 1

SELECT d.enum as Driver, t.TNUM, td.DESTINATION, td.DEPARTURE FROM driver d join trip t
on d.LNUM=t.LNUM join tripleg td on t.TNUM=td.TNUM where t.TNUM=1
union
SELECT d.enum as Driver, t.TNUM, td.DESTINATION, td.DEPARTURE FROM driver d join trip t
on d.LNUM=t.LNUM join tripleg td on t.TNUM=td.TNUM where t.TNUM=8;

$\pi_{d.enum \text{ as Driver, } t.TNUM, td.DESTINATION, td.DEPARTURE} (\sigma_{t.TNUM=1} (\rho_d \text{ driver } \bowtie_{d.LNUM=t.LNUM} \rho_t \text{ trip } \bowtie_{t.TNUM=td.TNUM} \rho_{td} \text{ tripleg}))$

\cup

$\pi_{d.enum \text{ as Driver, } t.TNUM, td.DESTINATION, td.DEPARTURE} (\sigma_{t.TNUM=8} (\rho_d \text{ driver } \bowtie_{d.LNUM=t.LNUM} \rho_t \text{ trip } \bowtie_{t.TNUM=td.TNUM} \rho_{td} \text{ tripleg}))$

Question 2

select t1.TNUM as Trip_Number,
(select t.lnum from trip t where t.TNUM = t1.TNUM) as License_Number,
(select d.enum from driver d where d.lnum = (select t.lnum from trip t where t.TNUM =
t1.TNUM)) as Driver ,
t1.DEPARTURE, t1.DESTINATION from tripleg t1 where t1.TNUM in(1,8);

$\pi_{t1.TNUM \text{ as Trip-Num, } (\pi_{t.lnum} (\sigma_{t.TNUM=t1.TNUM} \rho_t \text{ trip})) \text{ as License-Num, } (\pi_{d.enum} (\sigma_{d.lnum = (\pi_{t.lnum} (\sigma_{t.TNUM=t1.TNUM} \rho_t \text{ trip})) } \rho_d \text{ driver})) \text{ as Driver, } t1.DEPARTURE, t1.DESTINATION} (\sigma_{t1.TNUM \in \{1,8\}} \rho_{t1} \text{ tripleg})$

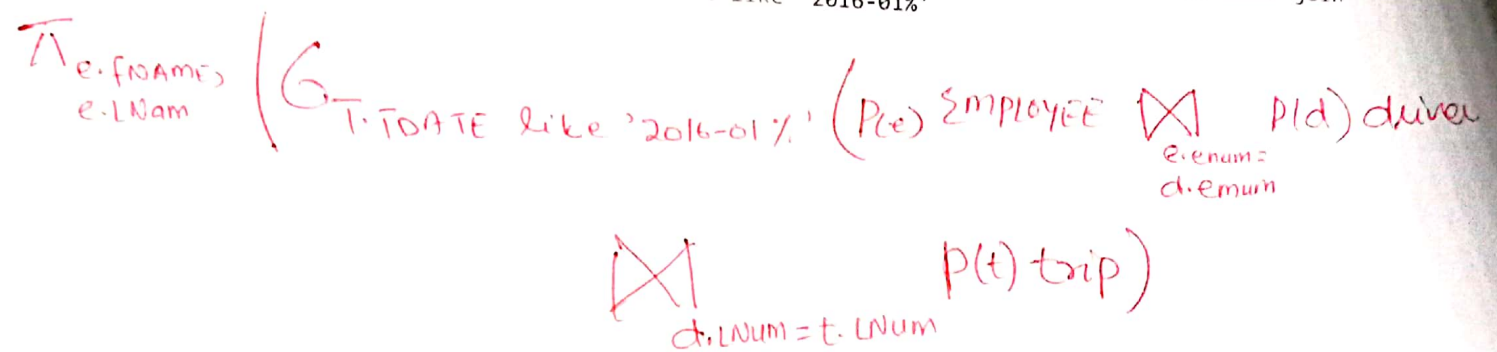
Question 3

select fname, lname from employee e where exists (select enum from driver d where exists
(select lnum from trip where year(TDATE)=2017 and lnum=d.lnum) and enum=e.enum);

$\pi_{fname, lname} (\sigma_{exists (\pi_{enum} (\sigma_{exists (\pi_{lnum} (\sigma_{year(TDATE)=2017} \rho_{trip}) \wedge lnum=d.lnum} \rho_d \text{ driver}) \wedge enum=e.enum} \rho_e \text{ employee})) } \rho_e \text{ employee})$

Question 4

select e.FNAME, e.LNAME from EMPLOYEE e inner join driver d on e.enum=d.enum inner join trip t on d.LNUM = t.LNUM where T.TDATE like '2016-01%'



Question 5

select REGNUM, count(REGNUM) No_of_trips from trip group by REGNUM



Type of operators

Selection σ

Projection π

Generalize Projection ρ

Rename ρ

Join, Equi, Natural Join \bowtie

Group by $\rightarrow \rho$

Join \bowtie condition.

Left outer join \ltimes

Right outer join \rtimes

Full join \ltimes

Assignment \leftarrow

Union \cup

Intersection \cap

Difference $-$

Difference = \div