Question1:

$\prod_{BusID,Age,Manufacturer}(\sigma_{AdvertisingRevenue>9000}(\text{Bus}))$

Question2:

$\gamma_{Count}(\delta \ (\prod_{Person.SIN \rightarrow NumOfStudent}(\sigma_{Occupation=\text{"Student"} \vee \text{Year (Current)} - \text{Year (DateOfBirth)} < 25}(\text{Person}))))$

Question3:

Bus: = $\prod_{BusID}(\sigma_{RouteID=5}(\text{Bus}))$

$\gamma_{Count}(\delta \ (\prod_{Person.SIN \rightarrow NumOfStudent}(\text{Person} \bowtie$
$BusID\ IN\ Bus \wedge \text{Date=5/3/2017} \wedge \text{Take.SIN=Person.SIN}(\text{Take})))$

Question4:

$\prod_{RouteID,\ TotalAdRev}(\gamma_{RouteID}\ (\tau_{Sum(AdvertisingRevenue) \rightarrow TotalAdRev}\text{desc}(\text{Bus})))$

Question5a:

$\gamma_{Person.SIN,\ Person.FirstName,Person.LastName}(\sigma_{Person.SIN\ IN\ getSIN}\ (Person))$

getSIN: = $\gamma_{SIN}(\sigma_{Count(SIN)<3}(\text{Infraction}))$

Question5b:

$\gamma_{TotalDemerit,\ TotalFine}(\tau_{Sum(Demerit) \rightarrow TotalDemerit,\ Sum(Fine) \rightarrow TotalFine} desc(\sigma_{Sum(Demerit) \geq 2}(\text{Infraction})))$

Question6:

notBusID: = $\prod_{b1.BusID}(\sigma_{b1.BusID\ != b2.BusID\ \wedge \text{b1.Manufacturer=b2.Manufacturer}}(\text{Bus b1} \bowtie Bus\ b2))$
$\prod_{BusID,\ Manufacturer}(\sigma_{BusID\ not\ IN\ notBusID}(\text{Bus}))$

Question7a:

$\gamma_{Passenger.Type}(\prod_{Passenger.Type,SUM(Fee) \rightarrow TotalFare}$
$(\text{Take} \bowtie_{Take.SIN=Passenger.SIN} Passenger \bowtie_{Passenger.Type=Fare.Type} Fare)))$

Question7b:

$\gamma_{Passenger.Type}(\prod_{Passenger.Type,SUM(Fee) \rightarrow TotalFare}$
$(\sigma_{SUM(Fee)>500}(\text{Take} \bowtie_{Take.SIN=Passenger.SIN} Passenger \bowtie_{Passenger.Type=Fare.Type} Fare))))$

Question7c:

$\gamma_{Passenger.Type}(\tau_{TotalFare}\text{desc}(\prod_{Passenger.Type,SUM(Fee) \rightarrow TotalFare}($
$\sigma_{Take.Date=\text{"5/1/2017"}}(\text{Take} \bowtie_{Take.SIN=Passenger.SIN} Passenger \bowtie_{Passenger.Type=Fare.Type} Fare)))))$

σ (Fetch First 1 Rows Only)

Question8a:

$\gamma_{Bus.RouteID}(\prod_{Bus.RouteID,NumofPassengers}(\tau_{count(Take.SIN)\rightarrow NumOfPassengers}$desc(
$\sigma_{Take.Date}$="5/7/2017" (Bus $\bowtie_{Take.BusID=Bus.BusID}$ $Take$))))

Question8b:

$\gamma_{Take.Date}(\prod_{Take.Date,NumofTrips}$
($\tau_{count(Take.BusId)\rightarrow NumOfTrips}$desc(Bus $\bowtie_{Take.BusID=Bus.BusID}$ $Take$)))

σ (Fetch First 1 Rows Only)

Question9:

$\prod$(δ(Person.Occupation))(σ5/5/2017≤$Take.Date$≤"5/6/2017" ∧ Sites.Category = "Library"
(Person $\bowtie_{Person.SIN=Take.SIN}$ $Take$ $\bowtie_{Take.BusID=Bus.BusID}$ Bus $\bowtie_{Bus.RouteID=Go.RouteID}$ Go $\bowtie_{Go.SIName=Sites.SIName}$ Si
))

Question10:

TotalDem: = $\gamma_{Infraction.SIN}(\prod_{SIN,Sum(Demerit)\rightarrow sumDem}$(Infraction))

$\prod_{Person.FirstName,Person.LastName,Person.SIN}$(
$\sigma_{Driver.YearsOfService}$>5∧Driver.Salary>80000 ∧TotalDem.sumDem<10
(TotalDem $\bowtie_{TotalDem.SIN=Person.SIN}$ $Person$ $\bowtie_{Person.SIN=Driver.SIN}$ $Driver$))

Question11:

$\prod_{Person.FirstName,Person.LastName,Person.Sex}$(
σ $Passenger.Type$=ST∧Bus.RouteID=4 ∧EName="Marauders Tennis"∧Take.Time≤Event.Time∧$Person.SIN=Passenger.SIN$∧
$Passenger.SIN=Take.SIN$∧$Take.BusID=Bus.BusID$∧$Take.RouteID=Bus.RouteID$ ∧$Take.Date=Event.Date$∧$Event.SIName=Go.SIName$

($Person \times Passenger \times Take \times Bus$ ×Event ×Go))

Question12:

$\prod_{Schedule.RouteID,Stop.SName,Schedule.ArrivalTime}$(
$\sigma_{Schedule.Date}$="5/1/2017"∧Hour(ArrivalTime)=16 ∧Event.EName="Marauders Basketball"∧Minute(ArrivalTime)≥20∧Minute(ArrivalTime)≤50
(Event $\bowtie_{Event.SIName=Stop.SIName}$ $Stop$ $\bowtie_{Stop.StopID=Schedule.StopID}$ $Schedule$))