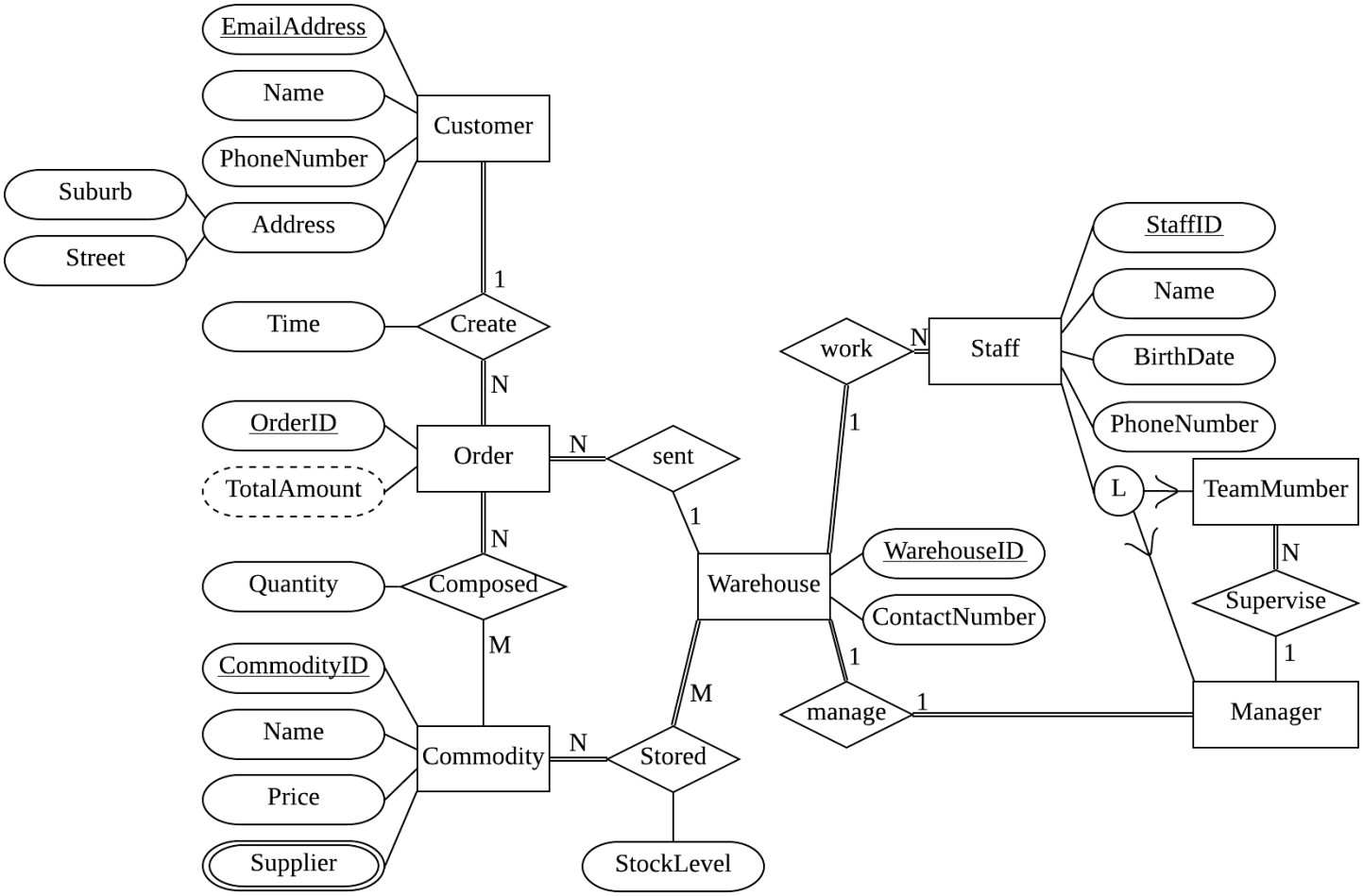
Question 1

Assumptions:



1）“A commodity may have multiple suppliers.”

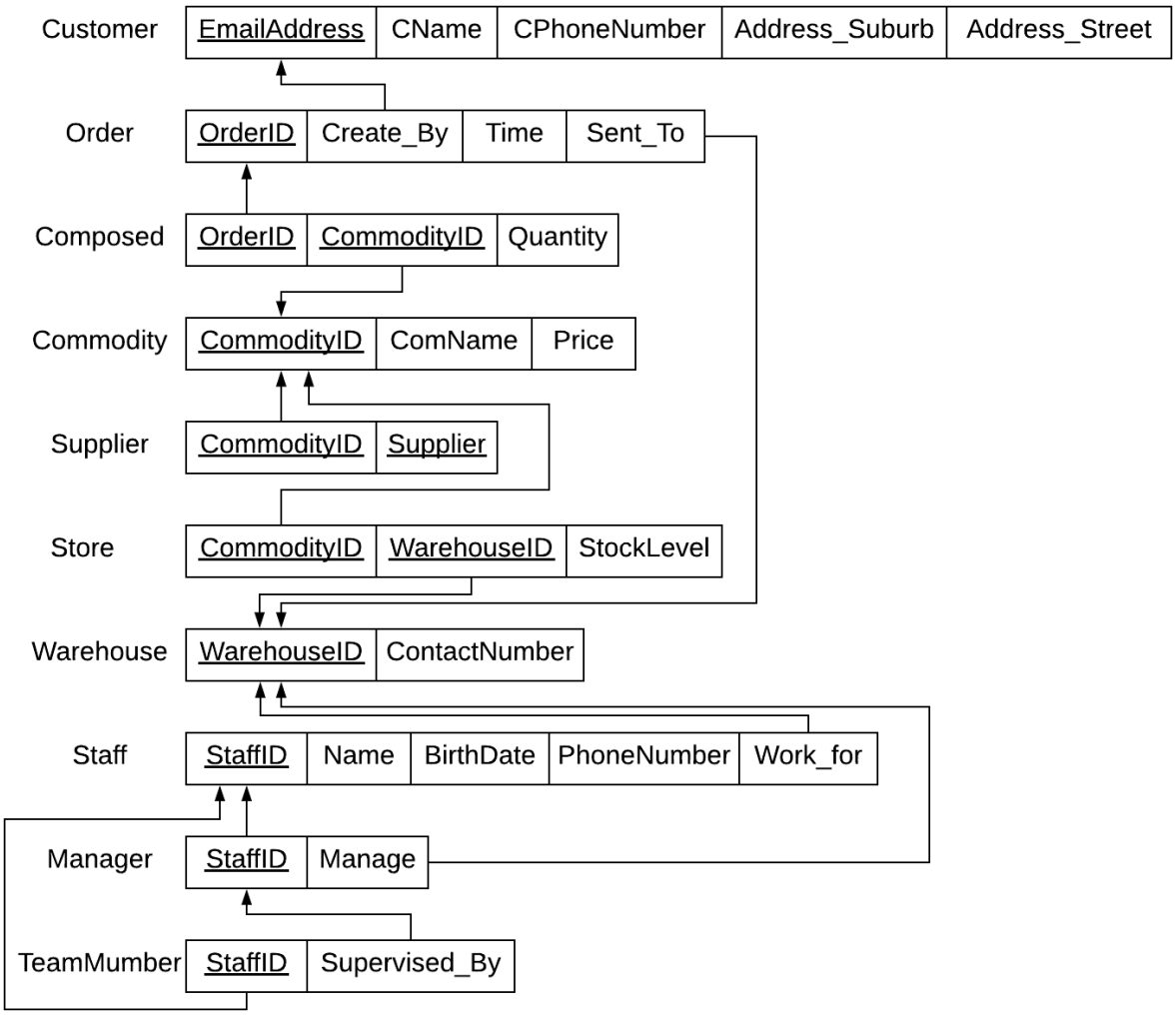
I assume it means that “a commodity” is a sort of commodities so it could have multiple suppliers. In this way, “a commodity must be stored in at least one warehouse and a warehouse must store at least one commodity”, as well as, a commodity could be stored in more than one warehouse.

2）“An order must be created by one customer and a customer must have created at least one order.” In addition, a customer may have created more than one order.

3）“A team member must be supervised by exactly one manager and a manager can supervise multiple team members.”

I assume that it is not required every manager must supervise team members. So there may be a manager doesn’t supervise any team member. According to the requirements “there must be exactly one manager at a warehouse” and “there should be at least one staff works in a warehouse”, there is a circumstance that a warehouse only has one staff which is the manager. Therefore, the assumption makes sense.

Question 2



Question 3

1)

$$\pi_{\text{name}}(\sigma_{(\text{gender} = \text{"female"})}(\text{Student} \bowtie \text{Enrolment} \bowtie \sigma_{(\text{job} = \text{"designer"})}(\text{JobRequiment})))$$

2)

$$\pi_{\text{name}}(\text{Student} \bowtie (\text{Enrolment} \div \pi_{\text{courseID}}(\sigma_{(\text{job} = \text{"designer"})}(\text{JobRequirement})) \cap \pi_{\text{courseID}}(\text{Enrolment} - \text{Enrolment} \bowtie \pi_{\text{courseID}}(\sigma_{(\text{faculty} = \text{"law"})}(\text{Course})))))$$

3)

$$\pi_{\text{courseName}}(\text{Course} \bowtie (\text{Enrolment} - \text{Enrolment} \bowtie \pi_{\text{studentID}}(\sigma_{(\text{gender} = \text{"male"})}(\text{Student})))) \cup \pi_{\text{courseName}}(\text{Course} \bowtie (\text{Enrolment} - \text{Enrolment} \bowtie \pi_{\text{studentID}}(\sigma_{(\text{gender} = \text{"female"})}(\text{Student}))))$$