3

**(a) A PC with a processor speed less than 2.00 must not sell for more than $500.**

$$\sigma_{speed<2.00 \wedge price>500}(PC)= \emptyset$$

**(b) A laptop with a screen size less than 15.4 inches must have at least a 100 gigabyte hard disk or sell for less than $1000.**

$$\sigma_{screen<15.4 \wedge hd<100 \wedge price \geq 1000} (Laptop) = \emptyset$$

**(c) No manufacturer of PC's may also make laptops.**

$$\pi_{maker}(Product \bowtie PC) \bigcap \pi_{maker}(Product \bowtie Laptop) = \emptyset$$

**(e) If a laptop has a larger main memory than a PC, then the laptop must also have a higher price than the PC.**

$$\sigma_{Laptop.ram > PC.ram \wedge Laptop.price \leq PC.price}(Laptop \times PC) = \emptyset$$