**Question1**

For each stapler, the cost of insourcing production is  
$(0.75+0.4+1.1)  
=$2.25

For each stapler, the cost of outsourcing production is  
$(0.95+0.55+1.4)  
=$2.9

As insourcing production has a lower cost than out sourcing production, we would use insourcing production whenever possible.

The time required for producing one stapler for location A   
=0.03+0.02+0.05 hour  
=0.1 hour

The time required for producing for one stapler for location B   
=0.04+0.02+0.04 hour  
=0.1 hour

The time required for producing for one stapler for location C   
=0.02+0.03+0.01 hour  
=0.06 hour

The number of staplers location Acanproduce for each 0.6 hour  
= 0.6 hours 0.1 hour per stapler  
=6 staplers

The number of staplers location Bcanproduce for each 0.6 hour  
 =0.6 hours 0.1 hour per stapler  
=6 staplers

The number of staplers location Ccanproduce for each 0.6 hour  
 =0.6 hours 0.06 hour per stapler  
=10 staplers

In every 0.6 hours, if three locations work together, 10+6+6 = 22 staplers can be produced.

In each hour, staplers can be produced.

In 400 hours, ×400 = 14666 staplers (round down to the nearest integer) can be produced in the company.

The rest is sent to sub-contractor for production since the insource production is full.

i.e. 18000-14666 = 3334 staplers need to be produced by sub-contractor.

The total production cost is 14666 × $2.25 + 3334 × $2.9  
= $42670

Total profit  
=18000×$3.5-$42670  
=$63000-$42670  
=$20330