Applied Microeconomics Exam

1a) $Q_D = 100 - P$

$Q_S = 4P$

Finding optimal P and Q:

$100 - P = 4P$

$100 = 5P$

$P = 20$

Putting P to demand function:

$Q = 100 - 20$

$Q = 80$

Optimal quantity: $Q = 80$, $P = 20$

1B) $\varepsilon = \frac{\partial Q}{\partial p} \cdot \frac{P}{Q}$ $\quad P = 20$, $Q = 80$

$$\varepsilon = \frac{100 - P}{\partial P} \cdot \frac{P}{Q}$$

$$\varepsilon = -1 \cdot \frac{20}{80}$$

$$\varepsilon = -0{,}25$$

A 1% increase in price leads to a 0,25 fall in quantity demanded. Of iphones. This also implies that the demand for iphone is not perfectly inelastic.

1c) tax on 5 kroner levied on consumers

$Q_D = 100 - P$

$Q_S = 4P$

Inverse demand:

$P = 100 - Q$

Inverse supply:

$P = 0{,}25Q$

tax levied consumers:

$P + 5 = 100 - Q$

$P = 95 - Q$

Inverse demand = Inverse supply

$95 - Q = 0{,}25Q$

$95 = 1{,}25Q$

$Q = 76$

The new equlibrium quantity is 76

1c) continued:

$P = 95 - Q$

$P = 95 - 76$

$P = \underline{19}$

The price producers pocket is 19.

The price consumers pay is price producers pocket + tax

So, $19 + 5 = \underline{\underline{24}}$

1D) $Q_D = \frac{1}{P}$ $Q_S = \frac{1}{4}P$

putting them equal

$$\frac{1}{P} = 0{,}25P$$

$$1 = 0{,}25P^2$$

$$4 = P^2$$

$$\sqrt{4} = \sqrt{P^2}$$

$$P = 2$$

Putting P into demand function:

$$Q = \frac{1}{2}$$

$$Q = \underline{0{,}5}$$

1e) $\frac{dQ}{dp} \cdot \frac{P}{Q}$ $\qquad P = 2$, $Q = 0{,}5$

$\varepsilon = 1P^{-1} \cdot \frac{P}{Q}$

$\varepsilon = \frac{1P^{-1}}{dP} \cdot \frac{P}{Q}$

$\varepsilon = -\frac{1}{P^2} \cdot \frac{2}{0{,}5}$

$\varepsilon = -\frac{1}{2^2} \cdot \frac{2}{0{,}5}$

$\varepsilon = 0{,}25 \cdot 4 = 1$

The price elasticity of demand is $\underline{\underline{-1}}$

2 a) The fixed costs in the short run are 64.

$C(q) = 64 + Q^2$

To find optimal number of rides: $MC = MR$

$MC = 2Q$

$MR = 28$

$28 = 2Q$

$Q = \underline{14}$

2 b) Each individual cab driver in the Short-run can have their profit function:

$$\pi = P \cdot Q - (TC)$$

or

$$\pi = R - C$$

Profit Short run:

$$\pi = 14 \cdot 28 - (64 + (14^2))$$

$$\pi = 392 - 260$$

$$\pi = 132$$

In the long run, number of cars (or taxis) will increase because there is a profit to get, and the fixed costs may vary in the long such that more competitors will join in this free competitive market.

2C) in the long run, prices will be pushed down to a new equlibrium price. This is because more competition will appear in the long run, and actors have to compete with each other in order to gain customers.

To find long-run equlibrium price and quantity we have to put AC^{min}

$$AC = \frac{64}{Q} + \frac{Q^2}{Q}$$

$$AC = \frac{64}{Q} + Q$$

$$AC' = 0$$

$$AC' = -\frac{64}{Q^2} + 1$$

Put equal to 0

$$-\frac{64}{Q^2} + 1 = 0$$

2c) $1 = \frac{64}{Q^2}$

$\sqrt{Q^2} = \sqrt{64}$

$Q = 8$

To find equilibrium price long run: $Q = 8$ into AC

$AC = \frac{64}{8} + 8$

$P = AC$

$P = \underline{16}$

2d) $Q = 96 - P$

$Q = 96 - 16$

$Q = 80$

$\frac{80}{8} = 10$

π = long run

$\pi = P \cdot Q - TC$

$\pi = 8 \cdot 16 - 64$

$\pi = 128 - 124$

$\pi = 4$

2E) Drivers in round 3 are making a loss, because there are one ~~tax~~ ~~ma~~ actor above the equlibrium quantity.

From 3 ~~to~~ 4, the cost functions have changed such that several drivers sees ~~they~~ ~~m~~ their costs have gone up and decides to leave the market and not partipicate.

In round 4 there is a shortage of taxi drivers, therefore, the taxi drivers in round 4 are making a profit

In round 5 we see that the costs for each driver has become less and people want to join the market again, and the number of participants goes to the equlibrium quantity

3 a) - Robert is sure Carl will attack, he will retreat, 0 is better than -5

If Robert is sure Carl will retreat, Robert will attack, 10 is better than 9.

If Carl is sure Robert will ~~attack~~, he will retreat, 0 is better than -5

If Carl is sure Robert will retreat, he will attack, 10 is better than 9

There are therefore 2 NE (0,10) and (10,0)

3B

$$EP(RD) = 4 \cdot P + 0 \cdot (1-P) = 4P$$

$$EP(RR) = 2 \cdot P + 1 \cdot (1-P) = 2P + 1 - P$$

$$4P = 2P + 1 - P$$

$$3P = 1$$

$$P = \frac{1}{3} \qquad 1-P = \frac{2}{3}$$

$$EP(CD) = 4 \cdot Q + 0 \cdot (1-Q) = 4Q$$

$$EP(CR) = 2 \cdot Q + 1 \cdot (1-Q) = 2Q + 1 - Q$$

$$4Q = 2Q + 1 - Q$$

$$3Q = 1$$

$$Q = \frac{1}{3} \qquad 1-Q = \frac{2}{3}$$

$$\left[\left(P = \frac{1}{3};\ 1-P = \frac{2}{3}\right)\left(Q = \frac{1}{3},\ 1-Q = \frac{2}{3}\right)\right]$$

3c) Camilla hunts rabbit more often. Rabit could be hunted alone. In addition this game is seperately and simultanously, which could give Camilla an incentive to go for what she could do alone, becaus she is unable to hunt a rabbit without deciding simultanously

3,D) $U(Y) = Y^2$

$EV = 0 \cdot 0{,}5 + 200 \cdot 0{,}5 = 100$

$EU = (0)^2 \cdot 0{,}5 + (200)^2 \cdot 0{,}5 = 2000$

$WTP = CE^{-1} = \sqrt{EU}$

$WTP = \sqrt{20000} = 141{,}42$

NO francis will not sell his ticket because he is not willing to accept 130

3#) $U(Y) = \log$

b)

i) We can see that Laura is risk neutral, linear function

$$EU = 0,5 \cdot 10 \cdot 0 + 0,5 \cdot 10 \cdot 200$$

$$EU = 1000$$

$$WTP = CE^{-1} = \frac{EU}{10} = \frac{1000}{10}$$

$$CE = 100$$

Because Laura is risk neutral, John could offer her 100dkk, so 130dkk is not the optimal choice for him.