TUTORIAL LETTER 1

Feedback
MULTIPLE CHOICE QUESTIONS

1. If the price elasticity is -0.3 this means:
   a) Demand is upward sloping
   b) Demand is price elastic
   c) A price fall would increase revenue
   d) Demand is price inelastic – If PeD < 1: inelastic, if PeD >1: elastic.
   \[ \text{Since PeD} = \frac{\text{Change in quantity}}{\text{change in price}}, \text{if PeD} < 1, \text{then change in Qd is less than change in price -> so inelastic (demand does not change very much with a change in price)} \]

2. If raising the cigarette tax from 10 cents per pack to 20 cents per pack left cigarette tax revenues unchanged, it could be concluded that the price elasticity of demand for cigarette was
   a) Elastic
   b) Inelastic
   c) Unit elastic – Since Change in TR=0, then Change in quantity = Change in price, thus PeD=1
   d) It is impossible to calculate from information given
3. Assume for a moment that utility is measurable. If a loaf of bread at N$20 per loaf gives 10 utils, a litre of milk costing N$50 must give how many utils in consumer equilibrium?

a) 5 utils  
b) 12.5 utils  
c) 25 utils  
d) 50 utils

In consumer equilibrium, \( \frac{U_b}{U_m} = \frac{P_b}{P_m} \) (the only difference here is that we are looking at utility rather than marginal utility). So: \( U_m = U_b \left( \frac{P_m}{P_b} \right) \) (cross multiply)= 10 (50/20)= 25

4. According the law of diminishing returns: We are talking about Production Theory

a) The marginal product falls as more units of a variable factor are added to a fixed factor – Since there are diminishing returns to the factors of production.

b) Marginal utility falls as more units of a product are consumed

c) The total product falls as more units of a variable factor are added to a fixed factor

d) The marginal product increases as more units of a variable factor are added to a fixed factor
5. The first level of output at which the long run average costs are minimised is called:

a) The Minimum Efficient Scale – Since cost minimisation is where greatest efficiency occurs
b) The Minimum External Scale
b) The Maximum External Scale
c) The Maximum Effective Scale

6. Which of the following is true?

a) If the marginal cost is greater than the average cost the average cost falls
b) If the marginal cost is greater than the average cost the average cost increases
Note that MC= cost of additional unit of output, whereas AC= TC/Q. So if MC> AC, the marginal unit will bring up the average.

a) If the marginal cost is positive total costs are maximized No, if MC=0.
b) If the marginal cost is negative total costs increase at a decreasing rate if output increases

If you are not sure of the answer, eliminate all of the answers you know to be wrong.
MULTIPLE CHOICE QUESTIONS

7. When internal economies of scale occur:
   
   a) Total costs fall
   
   b) Marginal costs increase
   
   c) Average costs fall – Economies of scale is where a producer spreads his (fixed) costs across his (large output), thus \( AC = \frac{TC}{Q} \) falls.
   
   d) Revenue falls

8. The average variable cost curve:
   
   a) Is derived from the average fixed costs
   
   b) Converges with the average cost as output increases – As output increases, \( AFC \) decreases (since FC stays the same but is spread over more and more units), and thus \( AVC \) comes close to \( ATC \)
   
   c) Equals the total (variable) costs divided by the output
   
   d) Equals revenue minus profits
9. Suppose a firm sells its product at a price lower than the opportunity cost of the inputs used to produce it. Which is true?

a) The firm will earn accounting and economic profits.
b) The firm will face accounting and economic losses.
c) The firm will face an accounting loss, but earn economic profits.
d) The firm may earn accounting profits, but will face economic losses.

Accounting profit = Total revenue – Total costs, whereas Economic profit takes into account Opportunity Cost (cost of best opportunity foregone. Example: profits that could have been earned by producing clothes instead of shoes)

10. Suppose that a firm produces 200,000 units a year and sells them all for N$10 each. The explicit costs of production are N$1,500,000 and the implicit costs of production are N$300,000. The firm has an accounting profit of:

a) N$500,000 and an economic profit of N$200,000.

Accounting profit = Total revenue -Total (explicit) costs = 200,000(10) - 1500,000 = 500,000
Economic profits = Accounting profits – Implicit costs (Opp. costs) = 500,000 – 300,000 = 200,000.
1. In a given market, demand is described by the equation:

\[ Q_D = 1800 - 10P \]

and supply is described by:

\[ Q_S = 200 + 10P \]

a) Determine the equilibrium price and quantity.

Equilibrium is where \( Q_d = Q_s \)

So: \( 1800 - 10P = 200 + 10P \)

\[ 20P = 1600, \quad P_e = 80 \]

Substitute this \( P \) into \( Q_d \) or \( Q_s \):

\[ Q_d = 1800 - 10(80) = 1000 \]

\[ \text{Check: } Q_s = 200 + 10(80) = 1000 \]

Thus \( Q_e = 1000 \)
SECTION B

b) Graphically illustrate the equilibrium price and quantity.

Market Equilibrium:

[Diagram showing supply and demand curves intersecting at equilibrium point labeled 'Equilibrium'. The price is 80 and the quantity is 1000.]
c) Determine the price elasticity of demand at the equilibrium level. 

Note that point elasticity = \( \frac{\text{Change in } Q}{\text{Change in } P} \times \frac{P}{Q} \) is to calculate elasticity at a certain point, whereas arc elasticity = \( \frac{\text{Change in } Q}{\text{Change in } P} \times \left[ \frac{(P_1 + P_2)}{Q_1 + Q_2} \right] \) is elasticity over two points.

Thus to determine PeD at equilibrium level, we must use point elasticity. [Check pg. 40]

We can calculate Change in Q and change in P using the Qd function. So let P = 10. Then Q = 1700

And let P = 20, then Q = 1600. So Change in P = 10 and Change in Q = 100. So change in Q/change in P = 100/10 = 10.

However, we know that Change in Q/Change in P is slope/coefficient of the demand curve: -10.

Thus PeD = -10 * (80 (Pe) / 1000 (Qe)) = -0.08

PeD is always negative! – According to the Law of Demand
d) Determine the surplus or shortage that would exist if the price were N$60. [3]

We know that $P_e = 80$, so if $P = 60$, then $Q_d$ will NOT equal $Q_s$ (there will be disequilibrium)

To calculate shortage/surplus, we must calculate $Q_d$ and $Q_s$ at $P = 60$.

So: $Q_d = 1800 - 10(60) = 1200$

And $Q_s = 200 + 10(60) = 800$.

Thus $Q_d > Q_s$ by 400.

If there is more demand than supply in the market, then this is a shortage.
SECTION B

2. Explain why for many goods, the long-run price elasticity of supply is larger than the short-run elasticity.

In the short-run, there are always some fixed factors of production (e.g. land and capital), thus producers cannot respond quickly and easily to a change in the market price. However in the long-run all FoP become variable, increasing producers responsiveness to price (PeS).

Example: I am a clothes manufacturer who sees a huge jump in the price of shoes. I cannot immediately switch to producing shoes in response to this, as I have already bought the clothes material and sewing machine. Over time, however, I can switch to producing shoes as I can sell my material / sewing machine to buy a shoe machine, and I can train my labourers in how to make shoes instead of clothes.
Katrina loves buying shoes and going out to dance. Her utility function for pairs of shoes, $S$, and the number of times she goes dancing per month, $T$, is

- $U(S, T) = 2ST$, so
- $MU_S = 2T$ and
- $MU_T = 2S$

It costs Katrina N$50 to buy a new pair of shoes or to spend an evening out dancing. Assume that she has N$500 to spend on clothing and dancing.

a) Show the equation for Katrina’s budget line and draw the budget line with $T$ on the vertical axis (label the slope and intercepts).

Budget line: Maximum combination of goods that can be purchased with a fixed sum of money given prices.

Budget line: $S \cdot Ps + T \cdot Pt = Income$

We should simplify this!

$S \cdot 50 + T \cdot 50 = 500$ (divide by 50)

$S + T = 10$ (4)
a) Show the equation for Katrina’s budget line and draw the budget line with $T$ on the vertical axis (label the slope and intercepts).

**Budget line: $S + T = 10$**

**T intercept** is where $S=0$, so $T=10$

**S intercept** is where $T=0$, so $S = 10$.

**Slope of budget line** is $(-)Ps/ Pt = -50/50 = (-) 1$.

Thus:

Slope of the budget line is always negative, as it shows number of X to be given up for one Y.

Fully label your graph!
a) What is Katrina’s marginal rate of substitution (MRS)? Explain.

Her marginal rate of substitution is how many shoes she will give up for one more time dancing.

MRS is the slope of the indifference curve. MRS is also always negative because of diminishing marginal utility, which says the more of one good she has, the less utility she gets from each additional unit (i.e. if she only went dancing, the MU shoes would be much greater than MU of times dancing).

MRS = (-) MUs / MUt = (-) 2T / 2S = (-) T/S.

Thus she will give up T/S units of shoes to get one more time dancing.
In consumer equilibrium, MRS (slope of indifference curve) = slope of the budget line [i.e. the IC is tangent to the BL].

Thus in equilibrium: $(-) \frac{T}{S} = (-) 1$ (Cross multiply)

$T = S$

From the budget line: $T + S = 10$ (Substitute in)

So $2T = 10$, thus $T = 5$, and $S = 5$

Thus the optimal bundle; $(S; T) = (5; 5)$
d) Show how to determine this bundle in a diagram using indifference curves and a budget line. [8]

In consumer equilibrium, slope of BL = slope of IC: thus these two curves touch/are tangent

**Consumer equilibrium**

Times dancing

![Graph showing consumer equilibrium with budget line and indifference curve, labeled with T-intercept, S-intercept, consumer equilibrium (5:5), and indifference curve: UST.](image)

- Budget line: \( S + T = 10 \)
- Slope of BL = (-) 1
- T-intercept: 10
- S-intercept: 10
- Indifference curve: UST
- Slope of IC = (-) \( T/S \)
- Te: 5
- Se: 5
- Shoes

Fully label your graph!
1. Governments often use a sales tax to raise tax revenue, which is the tax per unit times the quantity sold. Will a specific tax raise more tax revenue if the demand curve is inelastic or elastic at the original price? Explain.

If the question asks about PeD- don’t discuss supply (this is irrelevant to the question!)

When demand is inelastic, then quantity demanded changes less than proportionally to a change in price. Thus if government wanted to raise tax revenue, they should tax goods with inelastic demand, as the fall in quantity demanded (with the increase in price through the higher tax) will be less than the rise in price -> overall resulting in higher tax revenue for government. (Numerical example).

For example- governments like to tax cigarettes and alcohol, which have fairly low price elasticity of demand. Governments will also tax road usage (toll roads) and petrol, as motorists tend to have little to no alternatives (substitutes).

However, if governments raised the tax on fast food, consumers may switch to healthy alternatives (?)
Positive economics: descriptive, factual, can be tested.

e.g. The unemployment rate in Namibia is 35%.

Normative economics: Value-based, Opinions, ‘What ought to be’.

e.g. The unemployment rate is too high.

e.g. The inflation rate is more important than the exchange rate.