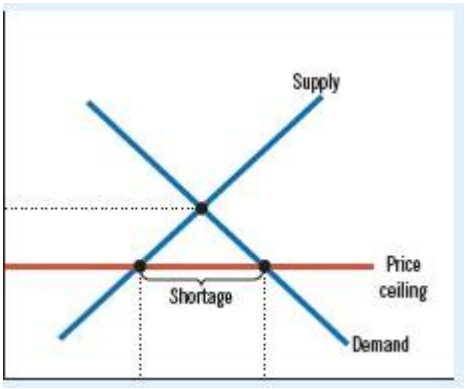
Answer Key - SET A

1. Answer the following sub-questions

a) Even though the price ceiling increases demand for the programme, fewer people will attend the programme as the supply will be restricted and a shortage is created as a result of a price ceiling.



b) True or False.

i. TRUE: A tax is a market distortion that reduces overall surplus in an economy by extracting tax revenue from consumers and producers. Even the smallest amount of tax imposition generates some cost of taxation in the form of deadweight loss.

FALSE: A case of perfectly inelastic demand or supply, the tax revenue can be positive without any cost of taxation or deadweight loss.

i. TRUE: When marginal product is increasing, in the early stages of production, the marginal cost will be declining.

ii. FALSE: Increase in the number of consumers indicates a price fall, that increases the surplus of existing consumers and raising surplus for the new consumers.

2. Cost function question

$$TC = 4000 + 5Q + 10Q^2$$

$$MC = 5 + 20Q \quad AC = \frac{4000 + 5Q + 10Q^2}{Q}$$

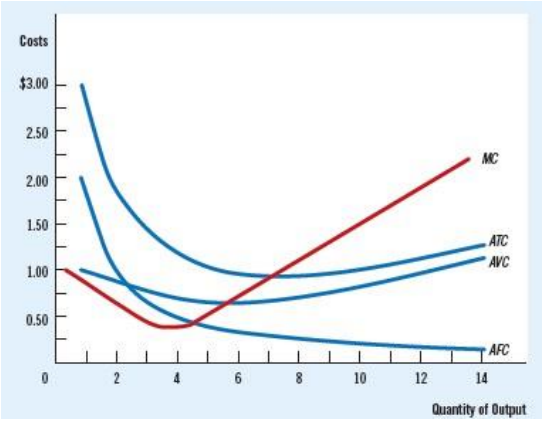
a) Minimum of AC is obtained where MC = AC

$$5 + 20Q = \frac{4000 + 5Q + 10Q^2}{Q}$$

$$5Q + 20Q^2 = 4000 + 5Q + 10Q^2$$

Solving for Q obtains Q that minimizes AC as Q = 20.

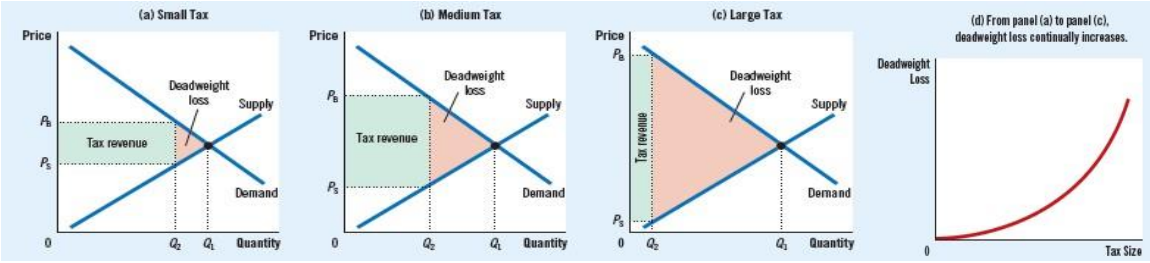
b) Minimum of AC is obtained where MC = AC. This can be detailed by the following graph or a hypothetical example, suiting the diagram below.



However, as a question for 4 marks, you are expected to explain in detail the whole process.

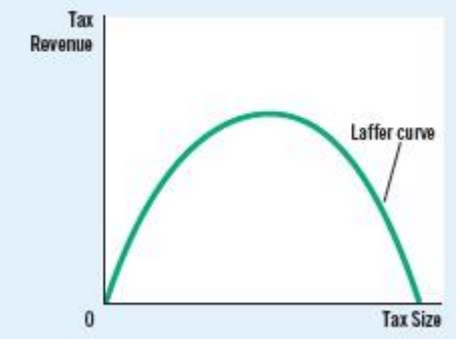
3. Answer the questions using appropriate diagrams

a) The imposition of a tax creates welfare loss the economy in the form of deadweight loss. The size of deadweight loss of increases with increased size of the tax.



b) The burden of taxation falls on the side **inelastic** side of the market as the inelastic nature represents inability to respond more than proportionately to a change in the tax.

c) No. The agreement is false. The Laffer Curve relationship indicates that tax revenue can be obtained maximum when the tax rate is optimum. Beyond the optimum level, people look for ways to evade taxation and the overall tax revenue reduces.



The question can also be answered using the three diagrams given above.

4. Fill in the type of cost that best completes each sentence:

a) Opportunity cost
b) Average cost
c) Fixed cost
d) Variable cost
e) Marginal cost

5. The market for mineral water

Demand: $Q^d = 120-P$; Supply: $Q^s = 5P$

a) $120-P = 5P$
$6P = 120$
$P = 20$
$Q = 100$

b) A tax of $6 on sellers.

New supply equation will be 5 (P-6) ➔ 5P – 30.

Please note that the tax is imposed on per unit of a commodity that the seller sells. And as a result of tax, the sellers receive a lower price, indicating P-6. The demand curve remains the same.

120-P = 5P – 30

6P = 150

P =25; Q = 95

c) A tax of $6 on buyers.

New demand equation will be 120 – (P+6) ➔ 120 – P -6.

Please note that the tax is imposed on per unit of a commodity that the buyer buys. And as a result of tax, the buyer has to pay a higher price, indicating (P+6). The supply curve remains the same.

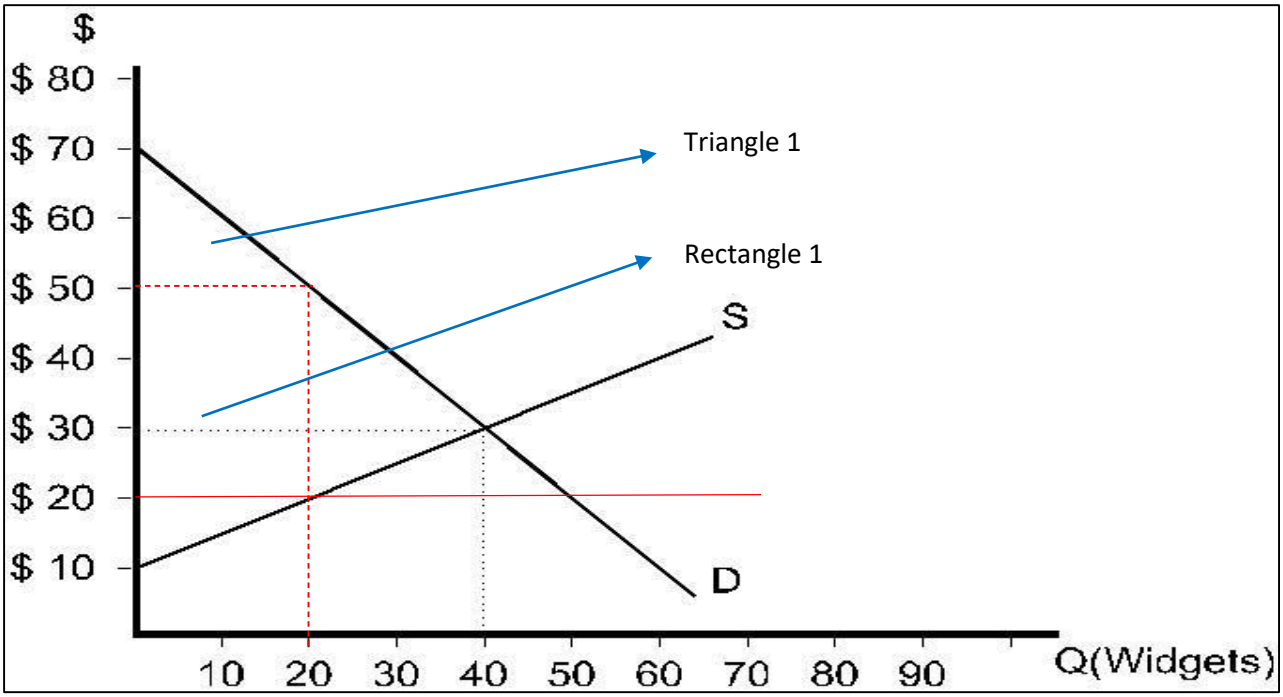
120-P-6 = 5P

6P = 114

P =19; Q = 95

Note that in the case of a buyer tax or seller tax, the output remains the same, **6.**

Consumer and producer surplus in price ceiling



a) Consumer surplus = ½ * 40 * (70-30) = $800

b) Producer surplus = ½ * 40 * (30-10) = $400

Total surplus 1 = $1200

When price ceiling of $20 is imposed, quantity demanded become 50 units but quantity supplied is 20 units. (DRAWING A STRAIGHT LINE DOWN GIVES YOU 20) There is a shortage. The available quantity is limited to only 20 units for which some consumers are willing to pay $50. Their consumer surplus will be triangle 1. Other consumers are willing to pay $20. Their consumer surplus is rectangle 1.

c) CS after price ceiling is = [(½ * 20 * (70-50)) + (20*(50-20))]= $800

d) PS after price ceiling is (as they receive only $20) = ½ * 20 * 10 = $100

Total surplus 2 = $900

e) Deadweight loss = TS 1 – TS 2 == $300.