BUSI 100

Answer Guide 13: PROJECT 2

Please note: **The answers provided below are considered to be a guide only. Assignment answers resembling those below would have received passing grades.**

Marks:

2 1. (a) The equilibrium price and quantity before the tax is P_1 and Q_1.
1 (b) P_0
1 (c) P_2
1 (d) P_2 minus P_1
1 (e) P_1 minus P_0

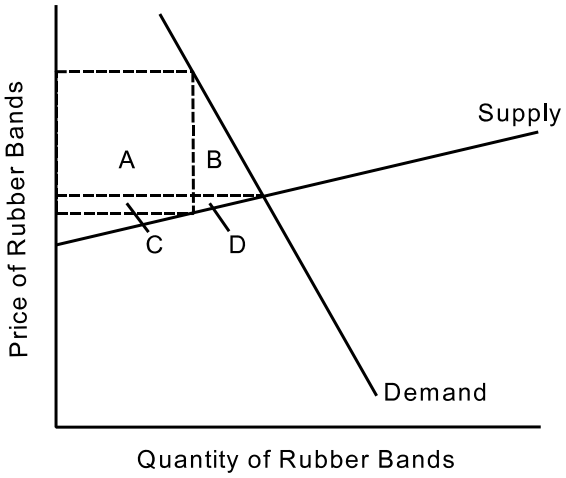
5 2. (a) The equilibrium price of frisbees is \$8 and the equilibrium quantity is 6 million frisbees.

4 (b) With a price floor of \$10, the new market price is \$10 since the price floor is the binding constraint in this market. At that price, only 2 million frisbees are sold, since that is the quantity demanded. At this price, suppliers would produce 12 million frisbees, leading to a 10 million frisbee surplus.

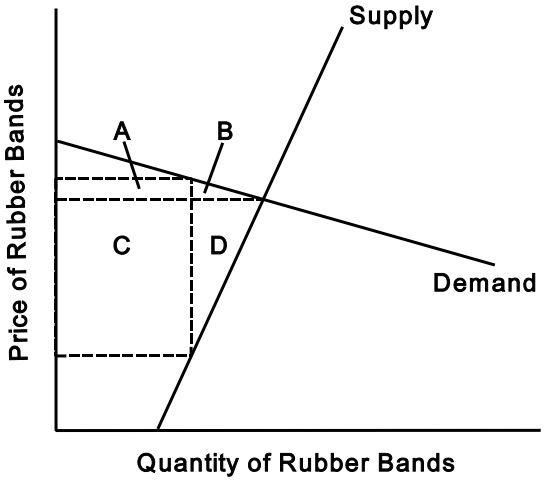
5 (c) If there is a price *ceiling* of \$9, it has no effect, since the market equilibrium price is \$8, below the ceiling. So the equilibrium price is \$8 and the equilibrium quantity is 6 million frisbees. If the price ceiling were instead set at \$7, then it would become a binding constraint, and 8 million frisbees would be demanded, but only 3 million would be supplied — a shortage of 5 million frisbees.

4 3. (a) If the price is P_1, there will be Q_1 units purchased.
(b) The consumer surplus is the area above the price and below the demand curve, which in this case is A + B + C.
(c) The new equilibrium will be P_2, Q_2
(d) Because the price has increased, buyers have left the market. The consumer surplus decreases by area B + C, and is now only area A.

5 4. (a) With very elastic supply and very inelastic demand, the burden of the tax on rubber bands will be borne largely by buyers. Sellers are more responsive to the price of the good, whereas buyers are not very responsive. The price received by the sellers does not fall as much, so sellers bear only a fraction of the tax burden. The price paid by the buyers rises substantially, indicating that the buyer bears most of the tax burden. As the following figure shows, consumer surplus declines considerably, by area A + B, but producer surplus does not fall much at all, just by area C + D. In general, a tax burden falls more heavily on the side of the market with less elasticity. Elasticity measures the willingness of buyers and sellers to leave the market when conditions become less favourable. In a market with fewer good alternatives, buyers cannot leave the market and must bear more of the burden of taxes.

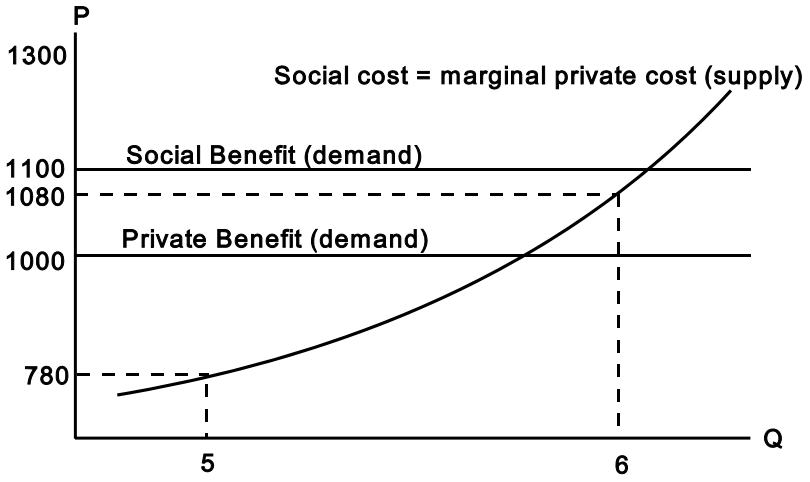


5 (b) With very inelastic supply and very elastic demand, the burden of the tax on rubber bands will be borne largely by sellers. Sellers are not very responsive to the price of the good, whereas buyers are very responsive when a tax is imposed. The price paid by buyers does not rise much, while the price received by sellers falls substantially. Thus, the sellers bear most of the tax burden. As the following figure shows, consumer surplus does not decline much, just by area A + B, while producer surplus falls substantially, by area C + D.



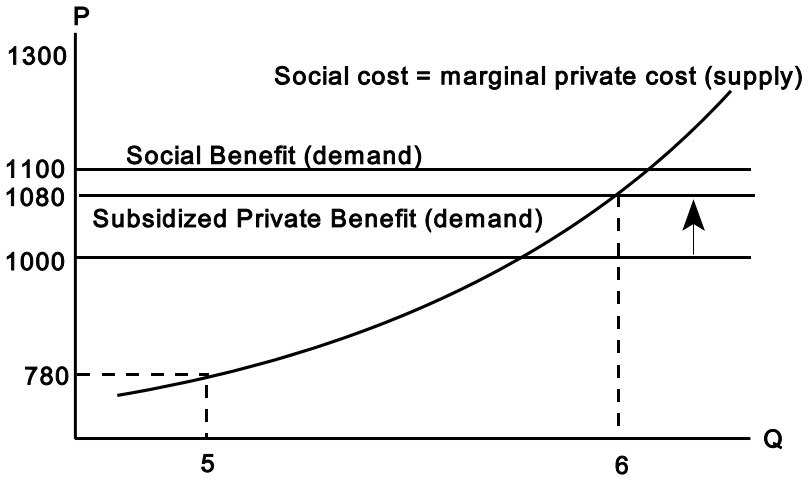
5 5. (a) See the following graph. Five students should be educated to maximize private welfare (rounding down to nearest whole number; in decimal terms, close to 5.8 students).

5 (b) See the following graph. Six students should be educated to maximize social welfare (rounding down to nearest whole number; in decimal terms, close to 6.2 students).

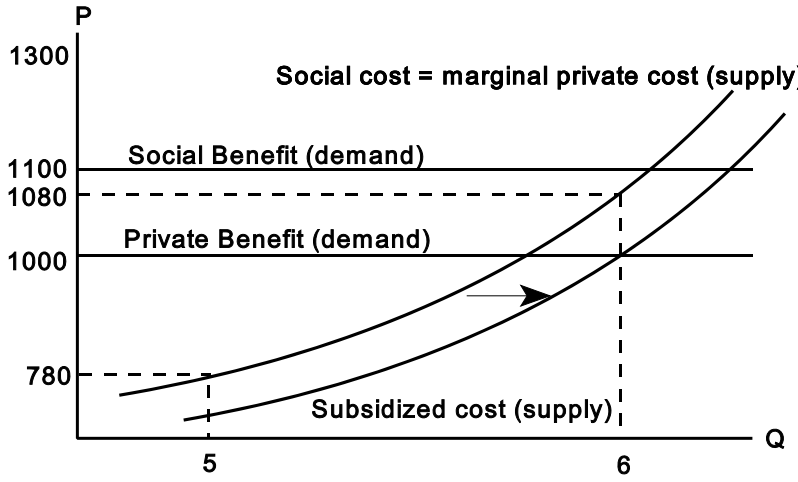


3 (c) The socially optimal number of students to be educated is 6. In order to achieve this, the government should subsidize either producers or consumers at the rate of $80 per student. Six students will be educated if the private benefit can be increased to $1,080 through an $80 subsidy to consumers (shift up demand) or if private cost at 6 students can be reduced to $1,000 through an $80 subsidy to producers (shift supply right). These two scenarios are outlined in the following figures.

Subsidize Consumers:

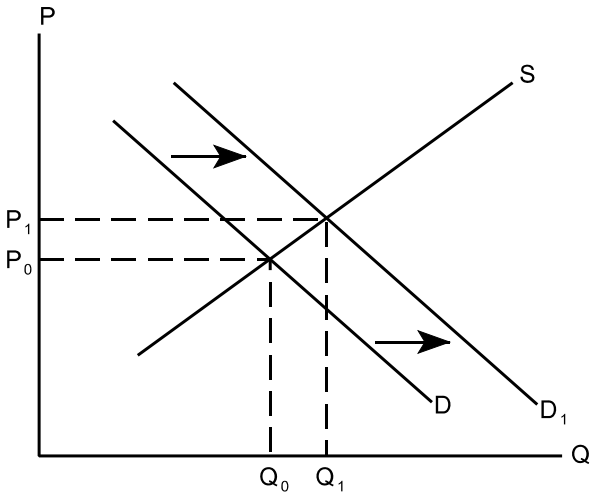


Subsidize Producers:



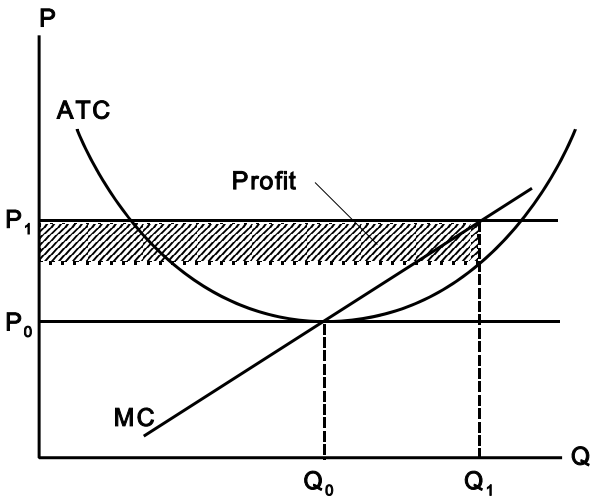
5 (d) Yes. If marginal social cost of education exceeds marginal social benefit of education then it makes sense not to educate some people. This condition is likely to be more evident in higher education than in primary and secondary education. Primary education in particular teaches basic skills necessary to everyone in society and the marginal social benefit is most certainly higher than its marginal cost for everyone in society.

5 6. (a)



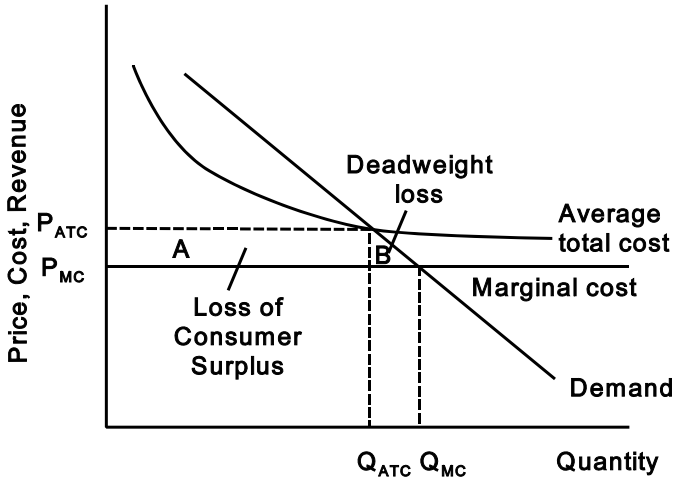
The assumption of perfect competition implies that there are many buyers and sellers in the market and the goods offered by the various sellers are largely the same. The market starts in long-run equilibrium at P_0, Q_0. When demand increases, the demand curve shifts outward. Price rises from P_0 to P_1 and quantity sold rises from Q_0 to Q_1.

5 (b)



The market starts in long-run equilibrium, meaning that each firm makes zero economic profit and price equals the minimum average total cost (P_0). When demand increases, price increases from P_0 to P_1. Price in this market now exceeds average total cost and firms make economic profits. [not required for this question: As a result of economic profits being earned, additional firms will enter this market. This will shift the supply curve in (a) to the right, which causes price to decrease back to the original P_0 level, but with a higher quantity sold than in the original long-run equilibrium.]

8 7. The figure below illustrates a situation where a natural monopolist is required to charge a price equal to average total cost (ATC). In a natural monopoly, average total costs are declining and marginal cost (MC) is lower than average total cost. If a monopoly is required to charge a price equal to marginal cost, then price will be below average total cost and the monopoly will lose money. Alternatively, if the price is set to equal average total cost, P_{ATC}, then the resulting quantity is Q_{ATC}. Marginal cost pricing would yield a quantity of Q_{MC}. Since for quantities between Q_{ATC} and Q_{MC} the benefit to consumers (measured by the demand curve) exceeds the cost of production (measured by the marginal cost curve), the deadweight loss from setting price equal to average total cost is the triangular area B shown in the figure. This represents the loss to society from not producing the additional quantity between Q_{ATC} and Q_{MC}. In a sense, average cost pricing has a similar effect to a tax on a good when there is a perfectly elastic supply curve. The consumer bears the burden of this tax through the loss of their consumer surplus (area A) and society suffers a deadweight loss (B).



70 Total Marks