1.3 (2.7) Answers questions 1-5 below

1.3 Government intervention

Indirect taxes/Subsidies/Price controls

1 a Equilibrium exists where demand = supply, i.e. at **P = $20** both demand and supply equal 20,000 units.

Award 1 mark for correctly identifying the equilibrium price.

b A price ceiling refers to the legal maximum price for a particular good (such as food products) or service (such as health care). It is a form of government intervention designed to protect individuals and households on low incomes as market prices could mean they are unable to afford important goods and services (such as housing).

Award 1 mark for a definition that shows limited understanding.

Award 2 marks for a clear definition that shows good understanding of the term 'price ceiling'.

c The minimum price of $25 means that demand = 15,000 units whereas supply = 24,000 units. Hence, there is excess supply of 9,000 units.

Award 1 mark for a brief answer that shows limited understanding.

Award 2 marks for a clear understanding of the impact of a price floor on the product.

2 a
- At P = $4, both demand and supply equal 6,000 units.
- Hence, the equilibrium price is **$4**.

Award 1 mark for correctly identifying the equilibrium price.

b ■ At P = $5, demand = 5,000 units while supply = 7,000 units.
■ Hence, the excess supply = **2,000 units**.

Award 1 mark for stating the correct excess supply.

c ■ The $2 per unit tax shifts the supply curve parallel to the left by the vertical distance of the tax.
■ Hence, the new supply at each price level now needs to be $2 more to create willingness and ability to supply, e.g. supply was 3,000 units at $1 but now needs to be $3 due to the tax.
■ Similarly, 5,000 units were previously supplied at $3, but to supply the same amount now requires a price of $5.
■ Hence, at $5, both demand and supply equal 5,000 units, i.e. the new equilibrium price is **$5**.

Qd	Price ($)	Qs
3,000	7	7,000
4,000	6	6,000
5,000	**5**	**5,000**
6,000	4	4,000
7,000	3	3,000
8,000	2	
9,000	1	

Award 1 mark for the correct answer and 1 mark for showing the working out.

d ■ At the equilibrium price of $5, quantity (output) = 5,000.
■ Hence, total tax revenue = $2 × 5,000 = **$10,000**.

Award 1 mark for the correct answer and 1 mark for showing the working out.

e Consumers used to pay $4 but now pay $5. As the tax per unit is $2, this means consumers pay **$1 per unit** of the tax burden.

Award 1 mark for a brief answer that shows limited understanding.

Award 2 marks for a clear understanding of how much of the tax incidence is borne by the consumer.

3 a ■ At P = $6, both demand and supply equal 60,000 units.
■ Hence, the equilibrium price is **$6** and the equilibrium quantity traded is **60,000**.

Award 1 mark for identifying the correct equilibrium price and 1 mark for the equilibrium quantity.

b ■ The subsidy enables supply to shift to the right, with the vertical distance between the two supply curves being equal to the per unit subsidy (of $1).
■ Previously, a price of $6.50 was required to generate supply of 70,000 units.
■ Now, with the $1 per unit subsidy, the same 70,000 units can be supplied at a price of $5.50.
■ Hence, the equilibrium price is now **$5.50** and equilibrium output is **70,000** units.

Qd	Price ($)	Qs
30,000	7.5	
40,000	7.0	
50,000	6.5	90,000
60,000	6.0	80,000
70,000	**5.5**	**70,000**
80,000	5.0	60,000
90,000	4.5	50,000

Award up to 2 marks for the correct answers and 1 mark for showing the working out.

c ■ The per unit subsidy = $1, and the quantity supplied = 70,000 units.
■ Hence, the total cost of providing the subsidy = **$70,000**.

Award 1 mark for the correct answer and 1 mark for showing the working out.

d
- The total subsidy (calculated in the previous question) = $70,000.
- However, as consumers only received $0.50 of the $1 per unit subsidy (they used to pay $6, but now pay $5.50), their incidence of the subsidy = **$35,000**.

Award 1 mark for the correct answer and 1 mark for showing the working out.

4 a
- Per unit tax = $20 – $10 (the vertical distance between the two supply curves) = $10
- Quantity traded = 30,000 units
- Hence, total tax revenue = 30,000 × $10 = **$300,000**.

Award 1 mark for the correct answer and 1 mark for showing the working out.

b
- Consumers used to pay $15 but now pay $20, i.e. an extra $5 per unit.
- Equilibrium quantity is now 30,000 units.
- Therefore, the total tax burden to consumers = 30,000 × $5 = **$150,000**.

Award 1 mark for the correct answer and 1 mark for showing the working out.

c
- Consumers used to spend $15 × 40,000 units = $600,000.
- They now spend $20 × 30,000 units = $600,000.
- Therefore, there is **no change** in total consumer spending after the tax.

Award 1 mark for the correct answer and 1 mark for showing the working out.

d
- The dead weight loss is the loss of consumer surplus and producer surplus when price was originally $15.
- It is equal to the triangular area: $\frac{(\$20 - \$10) \times (40{,}000 - 30{,}000)}{2}$ = **$50,000**.

Award 1 mark for the correct answer and 1 mark for showing the working out.

e
- Producer surplus is the difference between what suppliers received (market price of $20) compared to the price they were willing and able to supply.
- The new producer surplus is shown by the triangular area above the supply curve, under the horizontal price level.
- Hence, producer surplus = $\frac{(\$20 - \$5) \times 30{,}000}{2}$ = **$225,000**.

Award 1 mark for the correct answer and 1 mark for showing the working out.

f
- Previous consumer surplus = $\frac{(\$35 - \$15) \times 40{,}000}{2}$ = $400,000
- New consumer surplus = $\frac{(\$35 - \$20) \times 30{,}000}{2}$ = $225,000
- Therefore, the change in consumer surplus = $400,000 – $225,000 = **$175,000**.

Award 1 mark for the correct answer and 1 mark for showing the working out.

5 a At the minimum price of $30, there will be excess supply of 4,000 units. This is because at $30, supply will be 7,000 units, whereas demand will be only 3,000 units. Thus, a surplus exists due to the price floor.

Award 1 mark for a brief answer that shows limited understanding.

Award 2 marks for an answer that shows a clear understanding of the resulting excess supply.

b
- Consumers used to spend $20 × 5,000 units = $100,000.
- At the higher price of $30, they now spend only $30 × 3,000 = $90,000.
- Therefore, the change in consumer spending = **–$10,000**.

Award 1 mark for the correct answer and 1 mark for showing the working out.

c
- Producers used to earn $20 × 5,000 units = $100,000.
- At the higher price of $30, they now earn:
  - From consumers: $30 × 3,000 = $90,000.
  - From the government: $30 × 4,000 excess supply = $120,000.
  - Thus, total earnings are now $210,000.
- Therefore, the change in producer revenue = **+$110,000**.

Award 1 mark for the correct answer and 1 mark for showing the working out.

d
- The total amount spent on buying the excess supply = $30 × 4,000 = $120,000.
- If the government exports the excess supply, it receives $20 × 4,000 = $80,000.
- Hence, taxpayers have to pay for the difference, i.e. **$40,000**.

Award 1 mark for the correct answer and 1 mark for showing the working out.