

POE : Assignment 01

Date ____ 20 ____

23K-2001

BCS-3J

- i) Rises. (a)
- ii) Increases. (a)
- iii) Falls. (b)
- iv) All the above are possible. (d)
- v)

10,000 individuals for X. 1000 producers for X

$$Q_{dx} = \frac{1}{4} (12 - 2P_x)$$

$$Q_{sx} = \frac{1}{4} (20P_x)$$

a. $Q_D = 10000 \times Q_{dx}$

$$Q_S = 1000 \times Q_{sx}$$

$$Q_D = 10000 \times \frac{1}{4} (12 - 2P_x)$$

$$Q_S = 1000 \times \frac{1}{4} (20P_x)$$

$$Q_D = 2500 (12 - 2P_x)$$

$$Q_S = 250 (20P_x)$$

$$Q_D = 30000 - 5000P_x$$

$$Q_S = 5000P_x$$

Ans.

Ans.

b. Market Demand Schedule:

from price-levels 1-5: $Q_D = 30000 - 5000P_x$

P_x	Q_D
1	$30000 - 5000(1) = 25000$
2	$30000 - 5000(2) = 20000$
3	$30000 - 5000(3) = 15000$
4	$30000 - 5000(4) = 10000$
5	$30000 - 5000(5) = 5000$

At level-6:

Q_D becomes 0.

$$\Rightarrow 30000 - 5000(6) = 0$$

Market Supply schedule:

from supply-levels 1-5: $Q_s = 5000 P_x$

P_x	Q_s
1	$5000(1) = 5000$
2	$5000(2) = 10000$
3	$5000(3) = 15000$
4	$5000(4) = 20000$
5	$5000(5) = 25000$

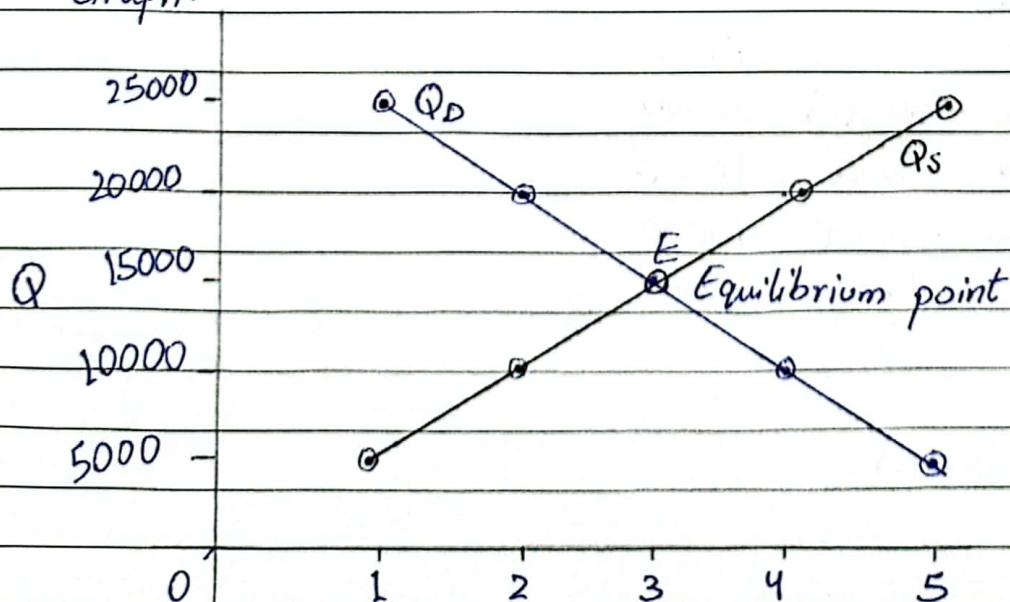
Equilibrium Price and Quantity

P_x	Q_D	Q_s	
1	25000	5000	
2	20000	10000	
3	15000	15000	→ Equilibrium point
4	10000	20000	
5	5000	25000	

Ans. The equilibrium price is at level 3 from which $Q_D = Q_s = 15000$

c.

Graph:



d.

Graphically, we can observe the market demand curve and market supply curve intersect at $P_x = 3$, which is the equilibrium point for commodity X. ($Q_D = Q_S = 15000$)

Mathematically:

for equilibrium point,

$$Q_D = Q_S$$

$$\Rightarrow 30000 - 5000P_x = 5000P_x$$

$$\Rightarrow 30000 = 10000P_x$$

$$\Rightarrow P_x = 30000 / 10000$$

$$\Rightarrow P_x = 3$$

Hence for $P_x = 3$

$$Q_D = 30000 - 5000(3), \quad Q_S = 5000(3)$$

$$Q_D = 15000$$

$$Q_S = 15000$$

Ans. Equilibrium quantity is 15000
for equilibrium price $P_x = 3$

vi) 10000 individuals for X

$$Q_{dx} = \frac{1}{4} (12 - 2P_x)$$

1000 producers for X

$$Q_{sx} = \frac{1}{4} 20P_x$$

After increase

$$Q_{dx} = 140000 - 20000P_x$$

$$Q_{sx} = 40000 + 20000P_x$$

a. Graph:

Find out market demand and supply,

$$Q_D = 140000 - 20000P_x$$

$$Q_S = 40000 + 20000P_x$$

Solve for P_x :

$$\therefore Q_D = Q_S$$

$$140000 - 20000P_x = 40000 + 20000P_x$$

$$100000 = 40000P_x$$

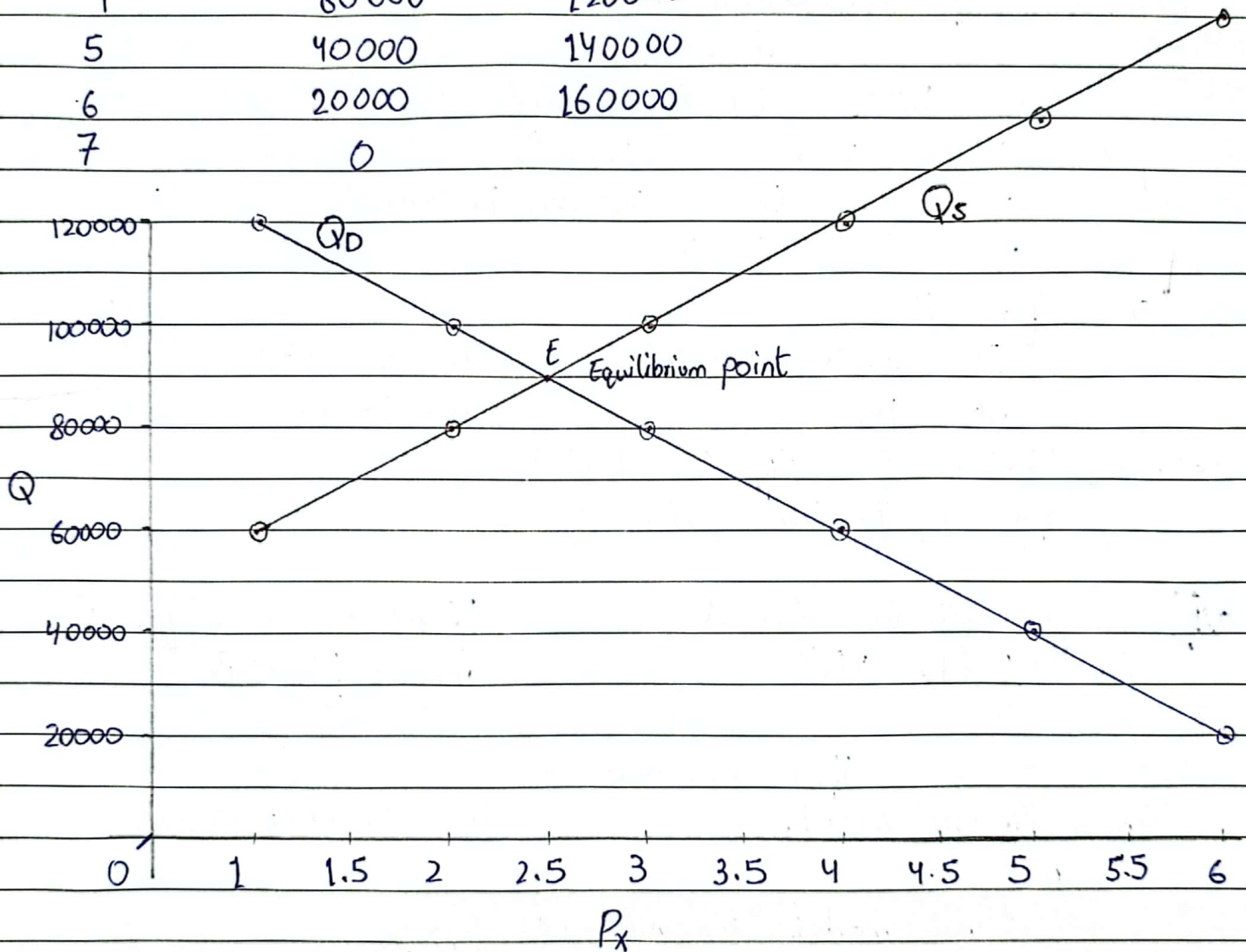
$$P_x = 100000 / 40000$$

$$P_x = 2.5$$

Find schedules

for levels 1-7

P_x	Q_D	Q_S
1	120000	60000
2	100000	80000
3	80000	100000
4	60000	120000
5	40000	140000
6	20000	160000
7	0	



The market demand curve and market supply curve intersect at $P_x = 2.5$, which is the equilibrium point for commodity X.

b) New equilibrium quantity:

$$P_x = 2.5$$

$$Q_D = 140000 - 20000(2.5), \quad Q_S = 40000 + 20000(2.5)$$

$$Q_D = 90000$$

$$Q_S = 90000$$

By graph and mathematically,

new equilibrium quantity $Q_E = 90000$ ($Q_D = Q_S$)

viii) from (v):

$$Q_E = 15000 \quad \text{for } P_x = 3$$

subsidy = \$1 for each unit

a.

The market supply curve changes as producers are now capable to sell commodity X at a lower price.

$$\Rightarrow Q_S = 5000(P_x + 1)$$

$$Q_S = 5000 + 5000P_x$$

Equilibrium point changes:

$$Q_D = Q_S$$

$$30000 - 5000P_x = 5000 + 5000P_x$$

$$25000 = 10000P_x$$

$$P_x = 2.5$$

New equilibrium quantity becomes:

$$Q_D = 30000 - 5000(2.5)$$

$$Q_D = 17500$$

$$\Rightarrow Q_E = 17,500$$

Ans. The equilibrium quantity increases to 17,500 for decrease in equilibrium price to $P_x = 2.5$

b) Consumer have now benefitted from the subsidy as they have to pay \$0.5 less per unit.

Also, quantity of X has increased from 15,000 to 17,500.

Commodity X is now available at a lower price and higher quantity.

viii) from (v):

$$Q_E = 15000 \quad \text{for} \quad P_x = 3$$

sales tax = \$2 per unit sold

a. The market supply curve shifts upward by \$2. as at every price level, sellers require \$2 per unit more to supply the same quantity.

$$\Rightarrow Q_S = 5000(P_x - 2)$$

$$Q_S = 5000P_x - 10000$$

Equilibrium point changes:

$$Q_D = Q_S$$

$$30000 - 5000P_x = 5000P_x - 10000$$

$$40000 = 10000P_x$$

$$P_x = 4$$

New equilibrium quantity becomes,

$$Q_E = 30000 - 5000(4)$$

$$Q_E = 10000$$

Ans. The equilibrium quantity decreases to 10,000 for increase in equilibrium price $P_x = 4$

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b) The tax amount is fulfilled by both; consumer and producer in the following way:

Consumers: previously one unit costed them \$3 but now $P_x = 4$, hence consumers are paying \$1 more per unit.

Producers: previously as $P_x = 3$, they received \$3 but now $(P_x - 2) = 4 - 2 = 2$, hence producers are receiving \$1 less than before.

$$\text{Tax} = \$2 = \$1 + \$1 \quad ; (\text{per unit})$$

payed by
consumer

payed by
producer

c) $Q_E = 10000$
Tax = \$2 / per unit

$$\begin{aligned} \text{Total amount of} &= 10000 \times 2 \\ \text{tax collected by government} &= \$20000 \quad \text{Ans.} \end{aligned}$$