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隨堂1: 已知 $n=40$, $Q^d = 2000 - 10P$, $STC = q_i^2 + 50q_i + 100$

(1) 廠商短期供給 (2) 市場供給 (3) 市場均衡價格與數量 (4) 廠商最適數量與利潤

ANS: (1) $P > AVC$ 的邊際成本曲線

$$MC = \frac{dSTC}{dQ} = 2q + 50$$

$$AVC = \frac{q^2 + 50q}{q} = q + 50$$

$P > AVC$

$2q + 50 > q + 50$

恆成立

$P = 2q + 50$ #

(2) $Q^s = \sum_{i=1}^{40} q_i$

$= 40 \left(\frac{P}{2} - 25 \right)$

$= 20P - 1000$ #

(3) $S = D$

$20P - 1000 = 2000 - 10P$

$P^* = 100$, $Q^* = 1000$ #

(4) $q = \frac{P}{2} - 25$

$= \frac{100}{2} - 25 = 25$

$\pi = TR - TC$

$= 100 \times 25 - (25^2 + 50 \times 25 + 100)$

$= 525$ #

隨堂2: 已知 $n=40$, $Q^d = 3500 - 10P$, $STC = q^2 + 50q + 100$

(1) 廠商短期供給 (2) 市場供給 (3) 市場均衡價格與數量 (4) 廠商最適數量及利潤

ANS: (1) $P > AVC$ 的邊際成本曲線

$$MC = \frac{dSTC}{dQ} = 2q + 50$$

$$AVC = \frac{VC}{Q} = \frac{q^2 + 50q}{q} = q + 50$$

$P > AVC$

$(2q + 50) > (q + 50)$ 恆成立

$P = 2q + 50$ #

(2) $Q^s = \sum_{i=1}^{40} q_i$

$= 40 \left(\frac{P}{2} - 25 \right)$

$= 20P - 1000$ #

(3) $S = D$

$20P - 1000 = 3500 - 10P$

$P^* = 150$, $Q^* = 2000$ #

(4) $q = \frac{P}{2} - 25$

$= \frac{150}{2} - 25$

$= 50$

$\pi = TR - TC$

$= 150 \times 50 - (50^2 + 50 \times 50 + 100)$

$= 7500 - 5100$

$= 2400$ #