

$$1. p = 60 - q \quad TC = 30q$$

$$(A) MR = 60 - 2q \quad MC = 30 \Rightarrow MR = MC$$

$$60 - 2q = 30 \quad q = 15$$

$$p = 45$$

$$\pi = 15 \times 45 - 30 \times 15 = 225$$

$$CS = \frac{15 \times 15}{2} = 112.5 \quad PS = 675 - 450 = 225$$

$$TS = 112.5 + 225 = 337.5$$

$$(B) p = MC = 60 - q = 30 \quad q = 30 \quad p = 30$$

$$\pi = \frac{30 \times 30}{2} + 30 \times 30 - 30 \times 30 = 1350 - 900 = 450$$

$$CS = 0 \quad PS = 1350 - 900 = 450 \quad TS = 450$$

$$(C) \pi = (60 - q_1) \times q_1 + (60 - q_2) \times (q_2 + q_1) - 30q_2$$

$$= 60q_1 - q_1^2 + 60q_2 - 60q_1 - q_2^2 + q_1q_2 - 30q_2$$

$$= -q_1^2 + 30q_2 - q_2^2 + q_1q_2$$

$$-2q_1 + q_2 = 0 \quad 30 - 2q_2 + q_1 = 0$$

$$q_1 = 10 \quad q_2 = 20 \quad p_1 = 50 \quad p_2 = 40$$

$$\pi = 50 \times 10 + 40 \times 10 - 30 \times 20 = 300$$

$$(D) \pi = (60 - q_1)q_1 + (60 - q_2)(q_2 - q_1) + (60 - q_1)(q_3 - q_2) -$$

$$30q_3 = 60q_1 - q_1^2 + 60q_2 - 60q_1 - q_2^2 + q_1q_2 + 60q_3 - 60q_2$$

$$-q_3^2 + q_2q_3 - 30q_3 = -q_1^2 - q_2^2 - q_3^2 + q_1q_2 + q_2q_3$$

$$+ 30q_3$$

$$-2q_1 + q_2 = 0 \quad -2q_2 + q_1 + q_3 = 0 \quad -2q_3 + q_2 + 30 = 0$$

$$\text{联立 } q_1 = 1.5 \quad q_2 = 15 \quad q_3 = 22.5 \quad p_1 = 52.5 \quad p_2 = 45 \quad p_3 = 37.5$$

$$\pi = 52.5 \times 1.5 + 45 \times 1.5 + 37.5 \times 1.5 - 30 \times 22.5$$

$$= 393.75 + 337.5 + 281.25 - 675 = 337.5$$