

$$1. \text{ (A) } 60 - 2q_1 - 30 \rightarrow q_1 = 15.$$

$$\Rightarrow p = 45 \Rightarrow N = 45 \times 15 - 30 \times 15 = 225 = PS$$

$$CS = 15 \times 15 = 112.5$$

$$TS = 225 + 112.5 = 337.5$$

$$DWL = 112.5$$

$$B) \quad q_1 = 30 \Rightarrow N = 30 \times 30 = 450$$

$$CS = 0, TS = 450, DWL = 0.$$

$$C) \quad \begin{cases} -2q_1 + q_2 = 0 \\ -2q_2 + q_1 + 30 = 0 \end{cases}$$

$$CS = (10 + \frac{50}{2}) \times 2 = 100$$

$$TS = 400$$

$$DWL = 50$$

$$\Rightarrow q_1 = 10, q_2 = 20$$

$$D) \quad \begin{cases} -2q_1 + q_2 = 0 \\ -2q_2 + q_1 + q_3 = 0 \end{cases}$$

$$\begin{cases} -2q_3 + 30 + q_2 = 0 \end{cases}$$

$$\begin{cases} q_1 = 7.5, q_2 = 15 \\ q_3 = 22.5 \end{cases}$$

$$q_1 = 7.5, q_2 = 15$$

$$q_2 = 15, q_3 = 22.5$$

$$q_3 = 22.5, q_4 = 52.5$$

$$N = 337.5$$

$$CS = 84.375, TS = 421.875$$

$$DWL = 28.125$$