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9. (A) 技術的成本函數 = 生產成本 + 規劃固定成本

$q = \frac{L}{2} = \frac{K}{4} \Rightarrow L = 2q$, $K = 4q \Rightarrow C = 1 \times 2q + 2 \times 4q = 10q$

$TC_A = 10q + 40$ #

$q = \frac{L}{4} = \frac{K}{2} \Rightarrow L = 4q$, $K = 2q \Rightarrow C = 1 \times 4q + 2 \times 2q = 8q$

$TC_B = 8q + 100$ #

(B) $q = 20$, $TC_A = 240$ $TC_B = 260$ ⇒ 應購買 (A) 技術

(C) $q = 40$, $TC_A = 440$ $TC_B = 420$ ⇒ 應購買 (B) 技術

(D) 令 $TC_A < TC_B$, 則 $q < 30$, 開產量低於30, 應購買 (A) 技術

11. (A) $q = 10L^{0.5}K^{0.5} \Rightarrow L^* = \frac{q^2}{100K}$ $STC = 10L^* + 10K = (q^2/10K) + 10K$

$AC = (q/10K) + (10K/q)$, $MC = (q/5K)$

(B) $\frac{\partial STC}{\partial K} = -\frac{q^2}{10K^2} + 10 = 0 \Rightarrow K^* = \frac{q}{10}$ 代入 STC ⇒ $TC = STC(K = K^*)$

$= \frac{q^2}{10(q/10)} + 10\frac{q}{10} = q + q = 2q$

12. $q = 20$, $AC - AVC = AFC = 10 \Rightarrow FC = AFC \times q = 200$ #

$q = 40$, $AC - AVC = AFC = FC/q = 200/40 = 5$ #

13. $VC(10) = \int_0^{10} 10q\,dq = 5q^2 \Big|_0^{10} = 500$, $TC = VC + FC = 600$ #