

# Production

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T-8

(1)

$$Q = 6L^2R^2 - 0.1L^3R^3$$

$$R = 10$$

$$Q = 6L^2 \cdot 100 - \frac{1 \times L^3 \times 10 \times 10 \times 10}{10}$$

$$Q = 600L^2 - 100L^3$$

$$\frac{dQ}{dL} = 1200L - 300L^2 = 0$$

$$1200L = 300L^2$$

$$1200L = 300L^2$$

$$L = \frac{1200}{300} = 4$$

$$Q = 6 \times 16 \times 100 - \frac{1 \times 16 \times 4 \times 1000}{10}$$

9600

6400

3200

Stage 1  $\rightarrow$  LLO - APmax

$\rightarrow$  PL (APmax - MPo)

$\rightarrow$  L (MPo onwards)

$$AP = \frac{Q}{L} = 6LR^2 - 0.1L^2R^3$$

$$\Rightarrow 600L - 100L^2$$

$$0 \rightarrow 600 - 200L = 0$$

$$L = 3$$

Stage 1  $\rightarrow$  (0-3)

Stage 2  $\rightarrow$  (3-4)

Stage 3  $\rightarrow$  4 onwards

$$Q = 20K^{0.1} L^{0.9}$$

$$K = 20, L = 50$$

$$= 20 (20)^{0.1} (50)^{0.9}$$

$$= 12.44$$

$$\Rightarrow \frac{dQ}{dL} = 20 \times (20)^{0.1} \times 0.9 L^{-0.1}$$

$$12.44 = 20 \times (20)^{0.1} \times 0.9 L^{-0.1}$$

$$12.44 = 20 \times 1.349 \times 0.9$$

$$L^{0.1} \cdot 37.57 = L^{-0.1} \cdot L^{0.1}$$

$$L^{0.1} = \frac{1}{37.57}$$

$$L^{0.1} = 0.026$$

$$\frac{MP_L}{MP_K} = \frac{w}{r}$$

$$\frac{K}{L} = \frac{w}{r}$$

$$\frac{20}{50} = \frac{w}{450}$$

$$w = 180$$

(3)

$$Q = 150L^{0.5} K^{0.5}$$

$$w = 50$$

$$K = 40$$

$$1118 = 150 L^{0.5} K^{0.5}$$

$$\frac{dQ}{dL} = 150 \times 0.5 \left( \frac{K}{L} \right)^{0.5}$$

$$\frac{dQ}{dK} = 150 \times 0.5 \left( \frac{L}{K} \right)^{0.5}$$

$$\frac{dQ/dK}{dQ/dL} = \left( \frac{K}{L} \right)^{0.5} \times$$

$$4K = 5L$$



$$K = \frac{5L}{4}$$

$$1118 = 150 \times \left(\frac{5L}{4}\right)^{0.5} (L)^{0.5}$$

$$7.245 = \left(\frac{5L}{4}\right)^{\frac{1}{2}} (L)^{\frac{1}{2}}$$

$$55.5025 = \frac{5L^2}{4}$$

$$L^2 = 44.402$$

$$L = 6.6$$

$$K = 8.3$$

(4)

$$MRTS = 0.15$$

$$w = 1330$$

$$MPK = 0.5$$

$$P = 9.5 \text{ lakhs}$$

$$MR = ? \left( \frac{QTR}{Q\theta} \right)$$

$$MRTS = -\frac{MP_L}{MP_K} = \frac{w}{K}$$

$$TR = P \times \theta$$

$$MR = \frac{QTR}{Q\theta} = P = 9.5 \text{ lakhs}$$

$$MRPK = MPK \times MR$$

$$= 9.5 \times 0.5$$

$$= 4.75 \text{ lakhs}$$

for optimal,

$$MRCK = MRPK = r$$

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$$\gamma = 4.75$$

$$m_{P_{1c}} = \frac{1330}{0.58 \times 4.75} = 0.0014$$

$$m_{P_{1c}} = \frac{0.0014}{0.5} = \underline{0.0028}$$