

Honor my answer
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question: 1; 3; 4; 5

1.

(a) $Q = -10P + 66000 \Leftrightarrow P = 6600 - 0.1Q$

i) $TR = P \cdot Q = 6600 - 0.1Q^2$

ii) $AR = \frac{TR}{Q} = P = 6600 - 0.1Q$

iii) $MR = \frac{\Delta TR}{\Delta Q} = -0.2Q + 6600$

(b) ~~Max~~: $\therefore TR \rightarrow \text{Max}$, $MR = 0$

$\therefore 6600 - 0.2Q = 0$

$Q = 33000$

$P = 3300$

$\therefore TR = 108900000$

(c) $\therefore Q = 50000$

$\therefore P = 1600$

$$EP = \frac{\frac{\Delta Q}{Q} \cdot \frac{P}{\bar{P}}}{\frac{\Delta P}{P}} = -10 \cdot \frac{1600}{500000} = -0.32 < 1$$

$\therefore \text{inelastic}$

3.

(a) $\therefore \text{profit} \rightarrow \max$

$$\therefore MR = MC$$

$$MC = \frac{\Delta STC}{\Delta Q} = 100 + 10Q + Q^2$$

$$TR = PQ = 300Q$$

$$MR = \frac{\Delta TR}{\Delta Q} = 300$$

$$\therefore MC = 100 + 10Q + Q^2 = 300$$

$$Q = 10$$

$$b) LTC = 54Q - 2.4Q^2 + 0.03Q^3$$

$$P = AC = MC$$

$$AC = \frac{LTC}{Q} = 54 - 2.4Q + 0.03Q^2$$

$$MC = \frac{\Delta LTC}{\Delta Q} = 54 - 4.8Q + 0.09Q^2$$

$$\therefore AC = MC$$

$$\therefore Q = 40$$

4.

(a) At least cost is the most desirable. But in this situation, I can calculate, so it can't be determined.

(b) when $k=4, l=2$

$$\therefore \text{tech 1} = 26$$

$$\text{tech 2} = 24$$

$$\text{tech 3} = 33$$

(c) when $k=3, l=3$

$$\text{tech 1} = 21$$

$$\text{tech 2} = 24$$

$$\text{tech 3} = 27$$

(d) when $k=2, l=4$

$$\text{tech 1} = 16$$

$$\text{tech 2} = 24$$

$$\text{tech 3} = 32$$

(e)

A	B	C	D	E	F	G	H	I	J	K	L
output	tech 1	tech 2	tech 3	output	tech 1	tech 2	tech 3	output	tech 1	tech 2	tech 3
1	26	24	22	1	21	24	27	1	16	24	32
2	34	36	32	2	30	36	39	2	26	36	46
3	46	48	44	3	42	48	54	3	38	48	64
4	62	60	60	4	57	60	75	4	52	60	90
5	78	72	76	5	72	72	96	5	66	72	116
6	106	84	92	6	96	84	117	6	86	84	142

①

②

③

5.

(a) $Q = 1500 - 10P \Leftrightarrow P = -0.1Q + 150$

$$TR = P \cdot Q = -0.1Q^2 + 150Q$$

$\therefore TR \rightarrow \text{Max}$

$$\therefore MR = 0$$

$$\therefore MR = \frac{\Delta TR}{\Delta Q} = -0.2Q + 150 = 0$$

$$\therefore Q = 750$$

$$P = 25$$

(b) $\therefore \text{Profit} \rightarrow \text{max}$

$$\therefore MR = MC$$

$$MR = -0.2Q + 150$$

$$MC = \frac{\Delta TC}{\Delta Q} = 80$$

$$\therefore Q = 350$$

$$P = 15$$

(c) $TR \rightarrow \text{max}, \pi_1 = -7750$

$\pi \rightarrow \text{Max}, \pi_2 = 8250$