Section A

Question 1

True - for example if goods are substitutes of each other, isoquants will be linear.

Question 2

Anushka

Min/Anushka	Mountain retreat	Beach vacation
Mountain retreat	6,1	0,0
Beach vacation	0,0	2,3

Min

True - Anushka will choose whatever Min chooses, and Min will choose whatever Anushka chooses. (mountain, mountain), (beach, beach) are both Nash Equilibria.

Question 3

False - Positive externalities lead to underproduction, whilst negative externalities lead to overproduction.

(Statement unclear)

Question 4

Uncertain - Agents will consume only the cheaper of the two goods. We are not told their relative pricing.

Question 5

$$Y = C + G + I$$
$$= (a + cY) + (G_0 - g \cdot Y) + (I_0 - br)$$

$$Y - cY + gY = a + G_0 + I_0 - br$$

$$Y = \frac{a + G_0 + I_0 - br}{1 - c + g}$$

$$\text{Multiplier} = \frac{1}{1 - c + g} < \frac{1}{1 - c}$$

True - Multiplier is 1/(1-c+g) which is smaller since g is a positive parameter.

Question 6

True - Real exchange rate adjusts for differences in price levels.

$$\text{Real Exchange Rate} = \frac{\text{Nominal Fx} \times \text{Pricing in Country A}}{\text{Pricing in Country B}}$$

Question 7

True - Contractionary monetary policy would hamper consumer's ability to take advantage of the increased supply of goods, and would instead lead to lay-offs due to increased output per worker.

Question 8

True - Full employment does not mean zero unemployment, and allows for frictional and structural unemployment. Improved matching reduces structural unemployment.

[Improved matching will increase output per worker, and thus total economic output, but in a state of zero employment, this will lead to increase in wages instead.]

Section B

Question 9

a) $P = 44 - 2Q$

$C(Q) = 8Q$

Total Revenue $= Q \cdot P$

$= 44Q - 2Q^2$.

Profits = Revenue - Cost

$$p = 44Q - 2Q^2 - 8Q$$

$$p = 36Q - 2Q^2$$

$$p' = 36 - 4Q$$

$$= 0 \Rightarrow \quad = \frac{36}{4} = 9.$$

In a monopoly, Alan will seek to maximise profits, resulting in;

$$\boxed{\begin{array}{l} \text{Quantity} = 9 \\ \text{Price} = 44 - 2(9) = £26. \\ \text{Profit} = (26)(9) - 8(9) = £162 \end{array}}$$

b) $C(q_i) = 8q_i$

$$P = 44 - 2(q_1 + q_2)$$

$$P_1 = q_1(44 - 2(q_1 + q_2)) - 8q_1$$

$$= q_1(36 - 2(q_1 + q_2))$$

$$= 36q_1 - 2q_1^2 - 2q_1 q_2$$

$$P_2 = 36q_2 - 2q_2^2 - 2q_1q_2$$

$$P_1' = 36 - 4q_1 - 2q_2$$

$$= 0 \Rightarrow q_1 = \frac{1}{4}(36 - 2q_2)$$

$$= 9 - \frac{1}{2}q_2.$$

Similarly $P_2' = 0$ for

$$q_2 = 9 - \frac{1}{2}q_1$$

$$q_1 = 9 - \frac{1}{2}\left(9 - \frac{1}{2}q_1\right)$$

$$= 4.5 + \frac{1}{4}q_1$$

$$q_1 = \frac{4}{3}(4.5) = 6 = q_2.$$

In Cournot-Nash, firms compete in quantities, assuming the competing firms' quantities are decided simultaneously and seperately.

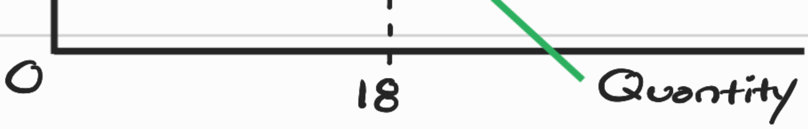
Each firm will produce $q_i = 6$ for an aggregate output of 12.

$$q_1 = q_2 = 6$$
$$Q = 12$$
$$P = 44 - 2(12) = £20$$
$$P_1 = P_2 = 6(36 - 2(12)) = £72$$
$$P = £144.$$

Total Profits under a Cournot-Equilibrium will be higher than under Perfect Competition but lower than under a Monopoly.

c) Price = Marginal Cost = £8.
Hence profits will = £0.

$$Q = \frac{1}{2}(44 - P)$$
$$= \frac{1}{2}(44 - 8) = 18.$$



d) The licensing fee (fixed cost) would not affect the Marginal Cost, leaving the market unchanged under perfect competition.
However, this could cause firms to exit the market, unwinding the perfect competition assumption, creating a monopoly / oligopoly. This would harm consumer welfare by increasing price and reducing quantity.

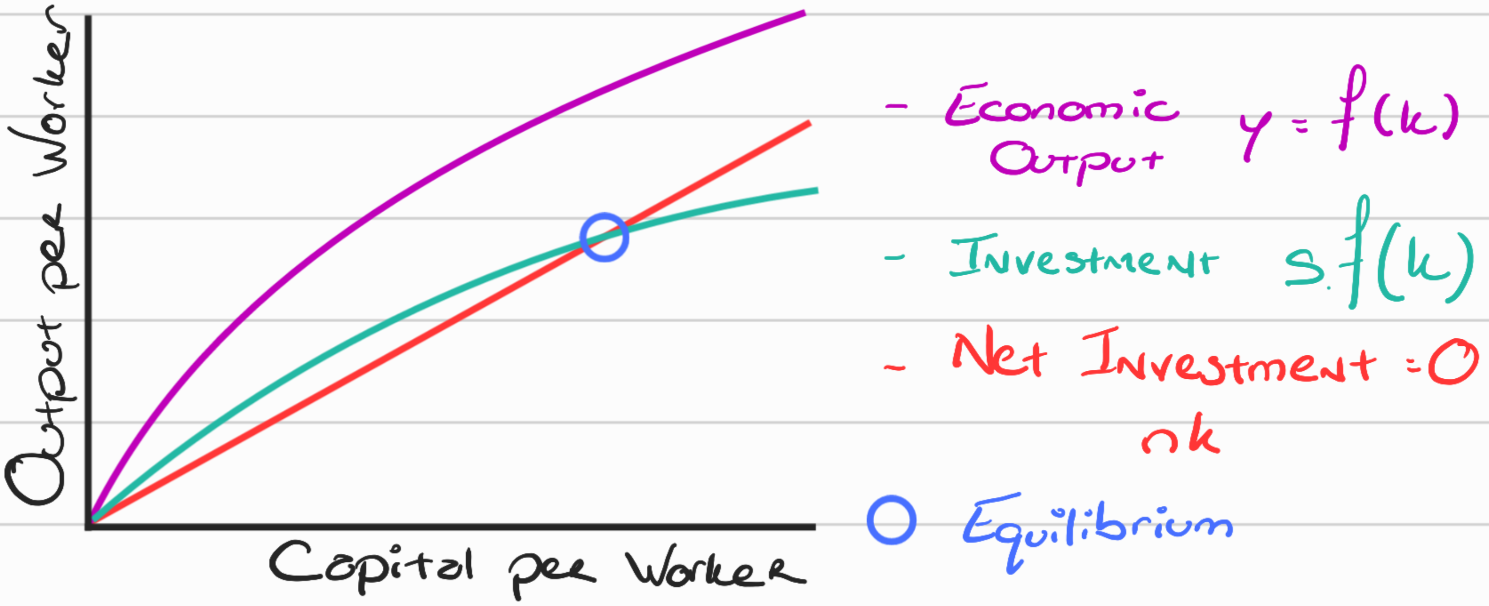
Question 10

a) $Y = F(K, L)$

$s, n > 0, \quad \delta = 0.$

$k = \frac{Y}{K}$ capital per worker

$y = \frac{Y}{L} = f(k)$ output per worker



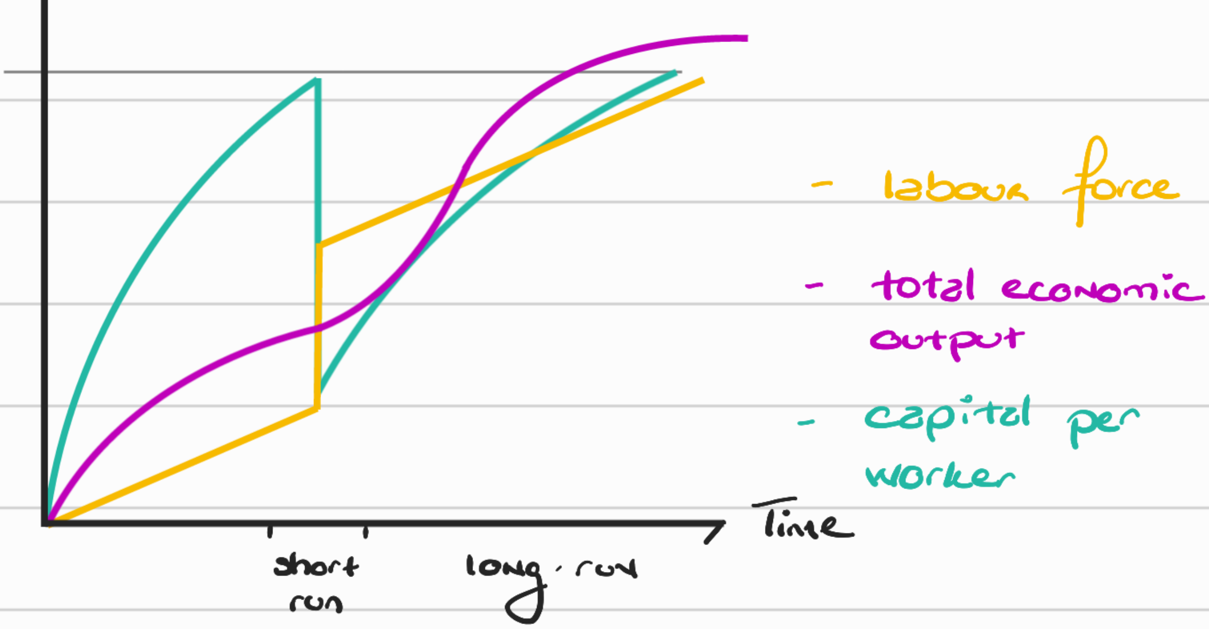
Despite having no depreciation, a growing workforce requires increasing capital to maintain capital/output per worker.

$$\frac{dk}{dt} = \text{investment per worker} - \text{break even investment.}$$

$$s.f(k) - (n+0)k$$

$$s f(k^*) = nk^*$$

b) In the short-run, the increased labour force will dilute existing capital, reducing capital/output per worker.
In the long-run, the economy should reach the same equilibrium, all things remaining equal.



c) $Y = K^{1/3} L^{2/3}$

$$y = \frac{Y}{L}, \quad k = \frac{K}{L}$$

$$y = \frac{K^{1/3} L^{2/3}}{L} = \frac{K^{1/3}}{L^{1/3}} = \left(\frac{K}{L}\right)^{1/3}$$

$$y = f(k) = f\left(\frac{K}{L}\right) = \left(\frac{K}{L}\right)^{1/3}$$

$$= f(k) = k^{1/3}.$$

$$s f(k) = n k^*$$

$s = 0.12$

$$0.12 \left[k^{1/3}\right] = 0.03\, k^*$$

$n = 0.03$

$$k^{2/3} = \frac{0.12}{0.03} = 4$$

$$k = \sqrt{4^3} = 8.$$

Since $k = 4$, there is room for k to grow, whereby it will increase to steady state $k^* = 8$.

Production function : $f(k) = k^{1/3}$.