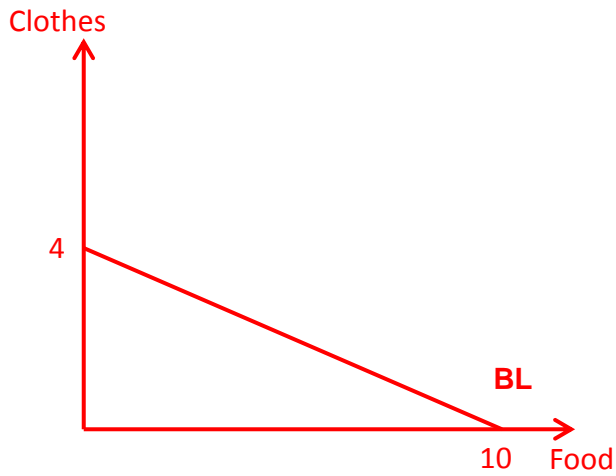


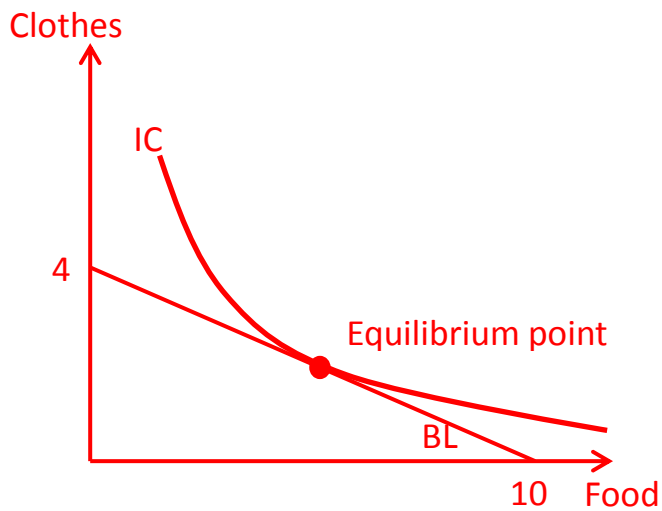
ECS2601 Oct / Nov 2014 Examination Memorandum

(1a) Raymond has a budget of R200. The price of food is R20 and the price of clothes is R50.

(i) Draw a budget line, with food on the horizontal axis. (2)



(ii) Suppose an indifference map exists, show his equilibrium point on the diagram above. (2)



(iii) Which condition must be satisfied to gain equilibrium? (2)

$MRS = P_f / P_c$

Or The slope of the IC = the slope of the budget line

Or The IC tangents to the budget line

Or $MU_f / MU_c = P_f / P_c$

(1b) (i) Define the cross-price elasticity of demand. (2)

Cross-price elasticity of demand is the percentage change in the quantity demanded of one good resulting from a 1-percent change in the price of another good.

OR

$$E_{Q_b P_m} = \frac{\Delta Q_b / Q_b}{\Delta P_m / P_m}$$

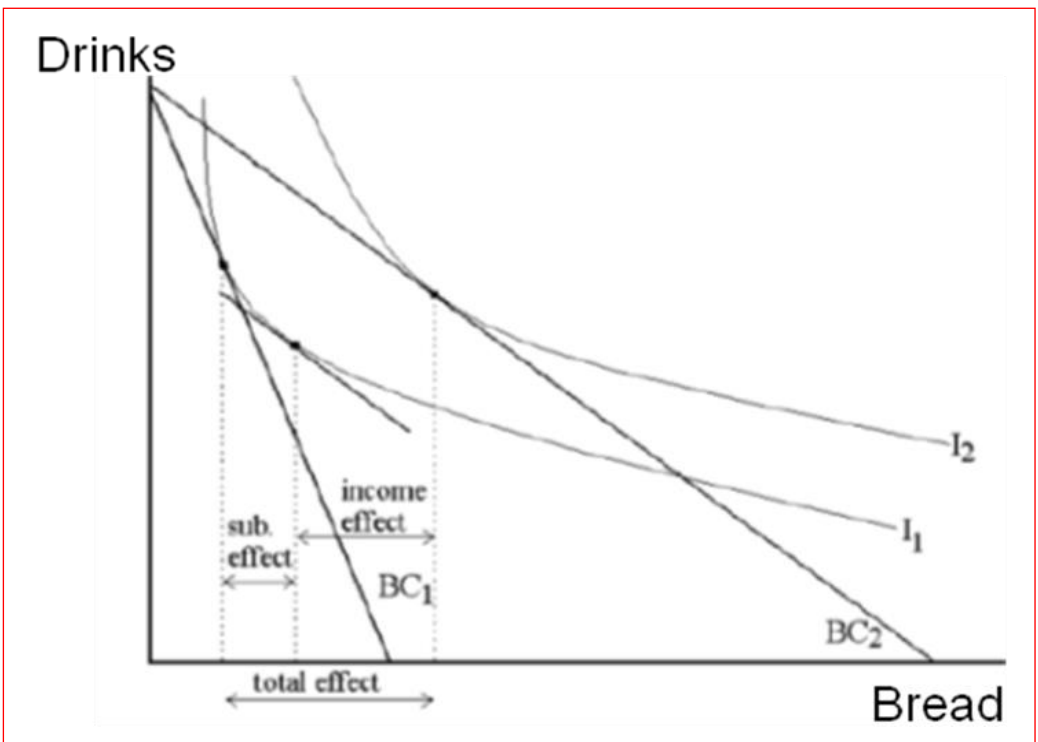
(ii) The cross-price elasticity of demand for peanut butter in comparison with the price of jelly is -0.3. If we expect the price of jelly to decline by 15%, what is the expected change in the quantity demanded for peanut butter? Show your calculations. (4)

-0.3 = (% change in quantity for peanut butter) / -15%

-0.3 X -15% = % change for peanut butter

% change for peanut butter = 4.5%

(1c) (i) The diagram below depicts the change in optimal consumption bundles for Mpho when the price of bread fall. Decompose the change into the income and substitution effects. Indicate the total effect, income effect and substitution effect in the diagram. (6)



(ii) Do the income effect and substitution effect work in opposite directions? (2)

No

2a. A firm's total cost function is given by the equation: (14)

$$TC = 4000 + 5Q + 10Q^2.$$

Write an expression for each of the following cost concepts:

(i) Total Fixed Cost

$$TFC = 4000$$

(ii) Total Variable Cost

$$TVC = 5Q + 10Q^2$$

(iii) Average Variable Cost

$$AVC = (5Q + 10Q^2) / Q \\ = 5 + 10Q$$

(iv) Average Total Cost

$$ATC = TC / Q \\ = (4000 + 5Q + 10Q^2) / Q$$

(v) Marginal Cost

$$MC = 5 + 20Q$$

(vi) Determine the quantity that minimizes average total cost. (4)

ATC is minimized where MC is equal to ATC.

Equating MC to ATC

$$(4000 + 5Q + 10Q^2) / Q = 5 + 20Q$$

$$4000 + 5Q + 10Q^2 = 5Q + 20Q^2$$

$$4000 = 10Q^2$$

$$Q^2 = 400$$

$$Q = 20$$

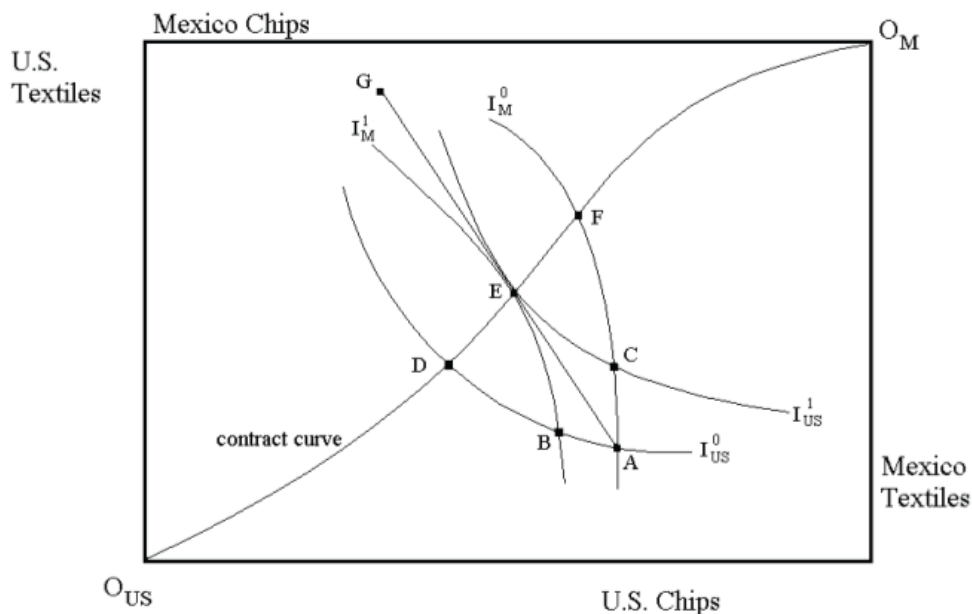
ATC is minimized at 20 units of output.

2b. Explain the difference between returns to scale and economies of scale. (6)

Returns to scale is a rate at which output increases as inputs are increased proportionately. There can be increasing returns to scale, constant returns to scale and decreasing returns to scale.

Economies of scale is a situation in which output can be doubles for less than a doubling of cost. As output increases, the firm's average cost (AC) of producing the output is likely to decline. There is also diseconomies of scale in which a doubling of output requires more a doubling of cost.

3a. Refer to the diagram below to answer this question.



- (i) Suppose the Edgeworth box diagram above pertains to trade between Mexico and the U.S. The consumption of computer chips and textiles in both countries is given by point A. At point A, what is true regarding the relative price of computer chips in the U.S. versus that in Mexico? (2)

At point A, the price of computer chips in the U.S. is relatively low when compared to Mexico.

- (ii) If trade brings about the efficient equilibrium, which point in the diagram indicates the level of consumption by each country? (2)

The efficient equilibrium is point E.

- (iii) At the new equilibrium, what has happened to the price of chips in Mexico? (2)

At the new equilibrium, the price of chips in the Mexico has gone down.

- (iv) How do we know both countries are better off with free trade? (4)

We know that both countries are made better off by free trade because they each attain an indifference curve that provides greater utility.

That is, the U.S. is on indifference curve I_{US}^1 at the equilibrium point which provides more utility than I_{US}^0 .

Mexico is on indifference curve I_M^1 at the equilibrium point which provides more utility than I_M^0 .

Thus, both countries are strictly better off by the movement from point A to point E.

3b. A monopolist faces the following demand curve, marginal revenue curve and marginal cost curve for its product:

$$P = 360 - 4Q$$

$$MR = 360 - 8Q$$

$$TC = 200 + 2Q^2$$

$$MC = 4Q$$

- (i) What level of output maximises the total revenue? Show calculation. (3)

Total revenue is maximized when the slope of TR is zero.

Slope of TR is MR

TR is max when MR = 0

$$MR = 360 - 8Q = 0$$

$$8Q = 360$$

$$Q = 45$$

- (ii) What is the profit maximising level of output? Show calculation. (4)

Profit is max when the firm produce at output level where MR = MC

Find Q where MR = MC

$$360 - 8Q = 4Q$$

$$12Q = 360$$

$$Q = 30$$

- (iii) What is the profit maximising price? Show calculation. (3)

$$P = 360 - 4Q$$

$$= 360 - 4(30)$$

$$= 360 - 120$$

$$= 240$$