

ECS2601 MAY 2015 MEMORANDUM

SECTION A

Candidates must answer QUESTION 1 and then **EITHER** QUESTION 2 **OR** QUESTION 3. All questions carry equal marks, namely 20 marks per question. Section A therefore counts 40 marks out of a total of 100.

QUESTION 1 (20 marks)

1a. Consider the following baskets of goods:

	FOOD	CLOTHING
A	8	3
B	6	6
C	3	8

If preferences satisfy all requirements, is A preferred to C or C to A? Explain your answer. (4 marks)

Basket A has more food than basket C.

Basket C has more clothing than basket A.

Therefore, basket A and C cannot be compared without additional information.

1b. An island economy produces only two goods – coconuts and pineapples. There are five people (A, B, C, D and E) living on the island, with these preferences:

A has a strong preference for pineapples.

B has a strong preference for coconuts.

C doesn't care for pineapples (assigns no value to them).

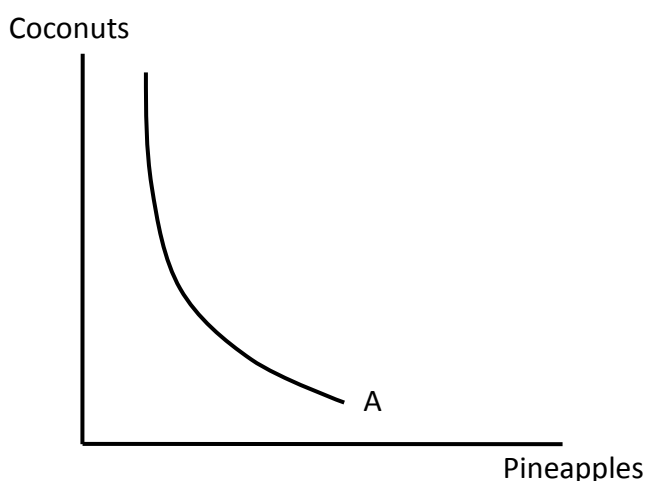
D doesn't care for coconuts (assigns no value to them).

E will only consume pineapples and coconuts in the fixed proportion of one pineapple to one coconut.

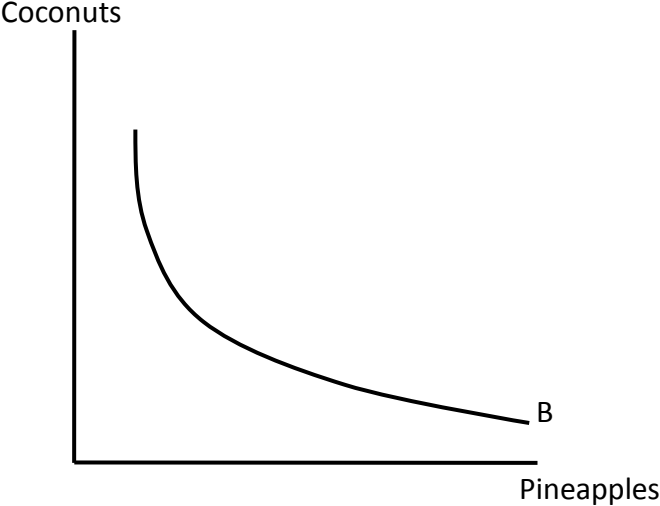
For each of these five individuals, construct a representative indifference curve with pineapples on the horizontal axis and coconuts on the vertical axis.

(10 marks)

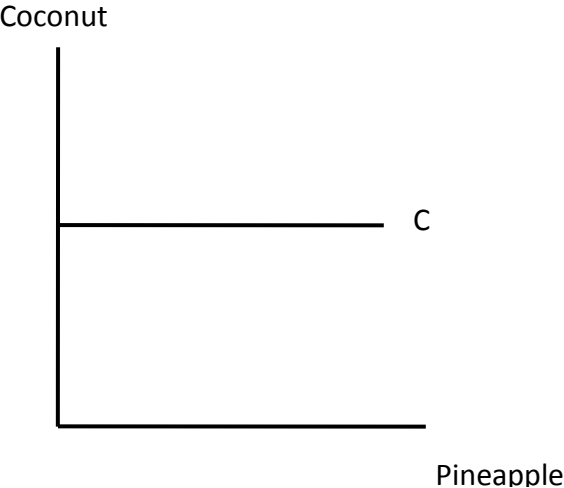
Person A: (2 marks each.)



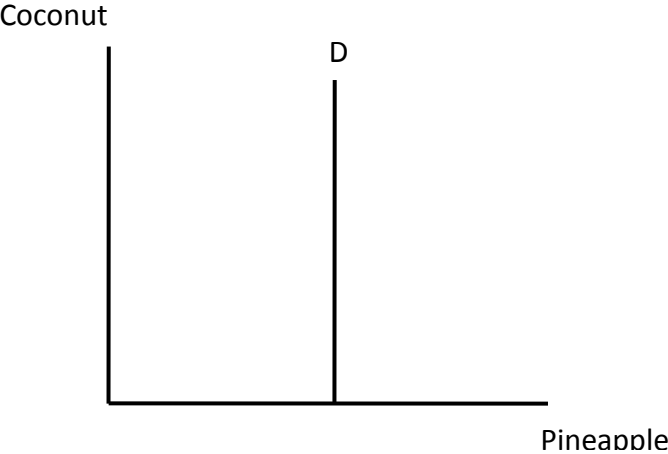
Person B:



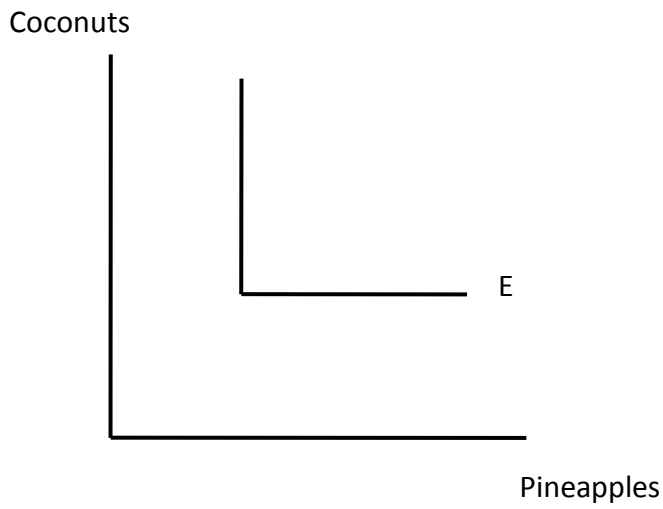
Person C:



Person D:

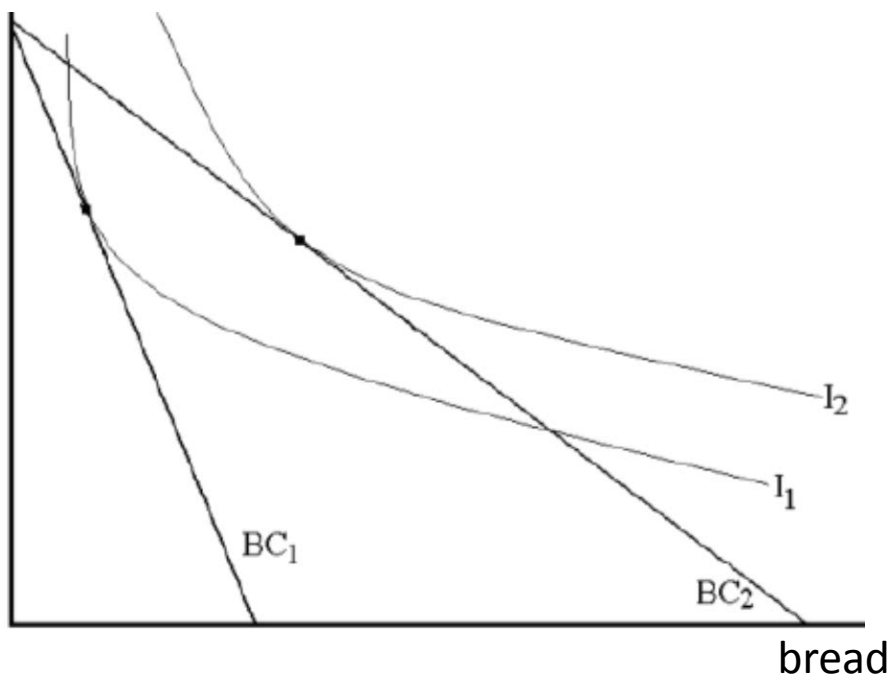


Person E:

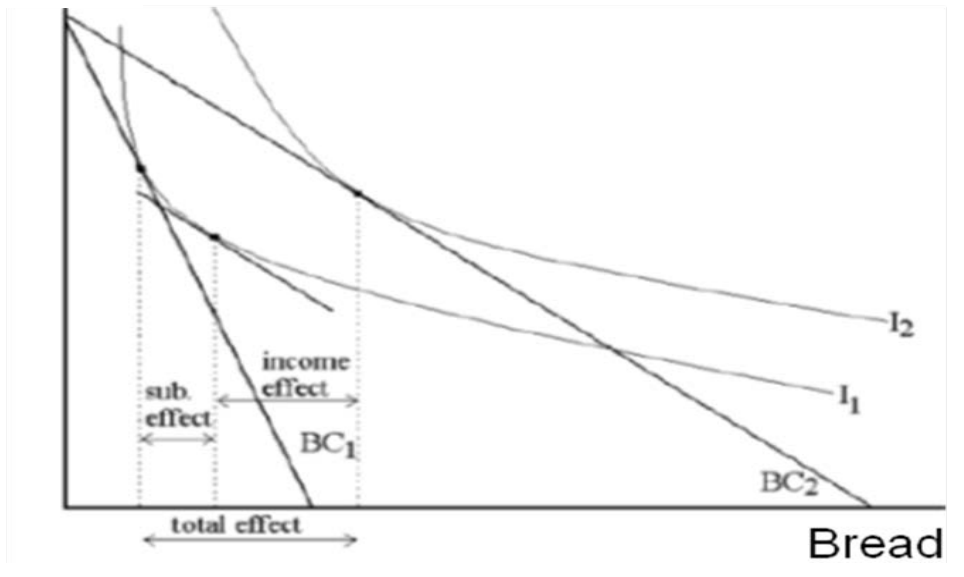


1c. The diagram below depicts the change in optimal consumption bundles for Kgomotso when the price of bread decreases. Decompose the change into the income and substitution effects. Indicate the total effect, income effect and substitution effect in the diagram. (6 marks)

Food



Food



A hypothetical budget line must be constructed to show income effect, substitution effect and total effect.

QUESTION 2 (20 marks)

2a. A fast-food restaurant currently pays R20 per hour for labour and R40 per hour to rent ovens and other kitchen machinery. The restaurant uses seven hours of labour time per unit of machinery time.

(i) Determine whether the restaurant is minimising its cost of production when the ratio of marginal products (capital to labour) is 10. (4 marks)

If the firm is minimizing its costs of production, then the MRTS will equal a ratio of prices of inputs.

**The ratio of prices $P_K / P_L = R40 / R20 = 2$
And the MRTS of capital for labour (MP_K / MP_L) = 10.**

Since these two ratios are not equal, the firm is not minimizing costs.

(ii) If not, what adjustments are called for to improve the efficiency of resource use? (2 marks)

To increase efficiency in the use of inputs, the firm should use more capital and use less labour to make the ratios equal.

Since these two ratios are not equal, the firm should change the mix of inputs.

2b. (i) The following table contains information for a price taking competitive firm. Complete the table (12 marks)

Output	Total Cost	Marginal Cost	Fixed Cost	Average Cost	Total Revenue	Average Revenue	Marginal Revenue
0	25	-	25	-	0	-	-
1	35	10	25	35	25	25	25
2	60	25	25	30	50	25	25
3	105	45	25	35	75	25	25
4	185	80	25	46.25	100	25	25
5	285	100	25	57	125	25	25
6	405	120	25	67.5	150	25	25

(ii) Determine the profit maximizing level of output (2 marks).

**The profit maximizing level of output is where $MR = MC$.
 $MR = MC$ at the level of 2. Hence should produce 2 units of output.**

QUESTION 3 (20 marks)

3a. Suppose a firm can practice perfect, first-degree price discrimination. What is the lowest price it will charge, and what will its total output be? (4 marks)

First-degree price discrimination is a practice of charging each customer her reservation price.

Hence the lowest price it will charge will be marginal cost (i.e. $P = MC$) and the output will be where $MC = AR$ (ie. the demand curve)

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

$$Q = 200 - 2P$$

$$MR = 100 - Q$$

$$TC = 5Q$$

$$MC = 5$$

(i) What is the profit maximising level of output? (3)

**Profit is max when the firm produce at output level where $MR = MC$
 Find Q where $MR = MC$
 $100 - Q = 5$
 $Q = 95$**

(ii) What is the profit maximising price? (3)

$$\begin{aligned}
Q &= 200 - 2P \\
95 &= 200 - 2p \\
2p &= 105 \\
P &= 52.5
\end{aligned}$$

(iii) What is the total profit earned?

(3)

$$\text{Profit} = \text{TR} - \text{TC}$$

When firm produces 95 units, $\text{TR} = P \times Q = R52.5 \times 95 = R4987.5$, while $\text{TC} = 5 \times 95 = R475$

$$\begin{aligned}
\text{Profit} &= R4987.5 - R475 \\
&= R4512.5
\end{aligned}$$

3b The two leading South African manufacturers of high performance radial tires must formulate their advertising strategies for the coming year. Each firm has two strategies available: maintain current advertising; or increase advertising by 15%. The strategies available to the two firms, A and B, are presented in the payoff matrix below:

	Firm B increases advertising	Firm B maintains advertising
Firm A increases advertising	18; 18	30; 6
Firm A maintains advertising	6; 30	24; 24

The entries in the individual cells are profits measured in millions of rands. Firm A's outcome is listed before the semicolon (;) and Firm B's outcome is listed after the semicolon (;).

(i) Which oligopoly model in the game theory is best suited for analysing this decision? (1 marks)

The prisoner's dilemma model is most appropriate for analysing this situation.

(ii) If each firm tries to choose a strategy that is best for it, regardless of the other firm's strategy, which strategy would firm B and firm A choose? Support your choice by using the given firm's payoffs. (6 marks)

Increasing the advertising level is the dominant strategy, since the firm is better off increasing regardless of the rival's action.

For example, if Firm B increases, Firm A earns 18 if it increases and 6 if it does not increase. A is better off to increase advertising.

If Firm B doesn't increase, Firm A earns 24 by not increasing and 30 by increasing. Again, Firm A is better off to increase.

It is obvious that no matter what B does, A is better off to increase.

The same reasoning works for firm B as well. Increasing the advertising level is also the best strategy for firm B.