

Main Examination Period 2023-24

ECN111 Microeconomics 1

Duration: 2 hours

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Answer ALL questions.

Non-programmable calculators are permitted in this examination. Please state on your answer book the name and type of machine used. Complete all rough workings in the answer book and cross through any work that is not to be assessed.

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Examiner: Dr Leon Vinokur

Answer all questions and provide an explanation.

Question 1 [7 marks]

Fiona runs a bakery where she bakes cakes and cookies. She can bake 10 cakes per hour but only 2 dozen cookies per hour. This week she has orders for 20 cakes and 50 dozen cookies. Due to her commitments with a local charity event, she cannot spend more than 15 hours baking this week. She realises she cannot complete all her orders but is determined to bake at least 15 cakes.

- a. Write Fiona's time constraint and her minimum cakes constraint, where x represents the number of cakes Fiona bakes and y represents the number of dozen cookies Fiona bakes.

(3 marks)

- b. Draw a graph with the number of cakes on the horizontal axis and the number of dozen cookies on the vertical axis. Plot the constraints in (a) on a graph and shade the area representing possible combinations of cakes and cookies Fiona can bake within her time constraints. Explain your answer.

(4 marks)

Question 2

Use separate graphs to draw two indifference curves for each of the following utility functions:

- a. $U(x, y) = \min\{2x + y, 2y + x\}.$
b. $U(x, y) = \max\{2x + y, 2y + x\}.$

In which of these cases are preferences convex? Briefly explain your answer and indicate the relation between the two indifference curves.

(7 marks)

Question 3

When both current and future consumption are normal goods, and there's an increase in the interest rate, what behavior can we expect from borrowers?

(7 marks)

Question 4

A monopolist with constant marginal costs faces a demand curve with a constant elasticity of demand and does not practice price discrimination. Determine whether the following statement is true or false and explain your reasoning.

If the government imposes a tax of £1 per unit of goods sold by the monopolist, the monopolist will increase his price by more than £1 per unit.

(7 marks)

Question 5

Draw two production isoquants for the following production function.

$$f(x, y) = \min\{2x, x + y\}.$$

(7 marks)

Question 6 [37 Marks]

Anna is indifferent between consumption in period 1 or period 2. Anna's utility function is given by $U(c_1, c_2) = c_1 + c_2$, where c_1 represents consumption in period 1 and c_2 represents consumption in period 2. Anna's initial endowment is £20 in period 1 and £40 in period 2. Anna considers buying Vincent's painting of vineyards for £12 in period 1, which can be sold for £20 in period 2. Anna derives no consumption benefits from using the item, and it costs nothing to store it for one period.

Turn Over

- a. Draw a graph, labelling her initial endowment, e. Draw the budget line showing combinations of period-1 and period-2 consumption that she can afford if she doesn't buy the painting. On the same graph, label the consumption bundle, a, that she would have if she did not borrow or lend any money but bought the painting in period 1, sold it in period 2, and used the proceeds to buy period-2 consumption.

(7 marks)

- b. If she cannot borrow or lend, should Anna invest in the painting?

(6 marks)

- c. Suppose that Anna can borrow and lend at an interest rate of 50%. On the graph where you labelled her initial endowment, draw the budget line showing all the bundles she can afford if she invests in the painting and borrows or lends at the interest rate of 50%. On the same graph draw two of Anna's indifference curves.

(6 marks)

- d. Suppose that instead of consumption in the two periods being perfect substitutes, they are perfect complements, so that Anna's utility function is $\min\{c_1, c_2\}$. If she cannot borrow or lend, should she buy the painting?

(6 marks)

- e. Assume again the original utility function. If she can borrow and lend at an interest rate of 50%, should she invest in the painting?

(6 marks)

- f. If she can borrow or lend as much at an interest rate of 100%, should she invest in the painting?

(6 marks)

Question 7 [28 Marks]

Assume a profit maximising perfectly competitive firm. Also assume the absence of government regulations or interventions in the market, such as taxes, subsidies, or price controls.

- a. Given the price, p and the cost function $c(y)$, where y is firm's output, establish the mathematical criteria for determining the short-run optimal level of the firm's output.

(7 marks)

- b. Explain how come that the "Giffen" phenomenon, i.e. supply decreases as price increases, cannot arise for supply curves.

(7 marks)

- c. What is the shutdown condition? When does this make economic sense? Demonstrate the solution algebraically and carefully explain your answer.

(7 marks)

- d. Draw a supply curve function demonstrating the condition (c) above.

(7 marks)

End of Exam Paper