Queen Mary
University of London

May/June Examination Period 2025

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

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Question 1

Gabriel has preferences represented by the utility function $U(z, k) = zk$. She consumes 10 units of good z and 6 units of good k. If her consumption of good z is lowered to 4, how many units of k must she have to be exactly as well off as before? Explain your answer.

[6 marks]

Question 2

Explain the difference between Giffen and inferior goods.

[6 marks]

Question 3

There are two goods. Assume that income doubles and the price of good 1 doubles while the price of good 2 stays constant. If the consumer's demand for good 2 decreases, what type of good is it? Explain your answer.

[6 marks]

Question 4

Betty has a utility function $U(c_1, c_2) = min(c_1 + 2c_2, c_2 + 2c_1)$, where c_1 and c_2 are her consumption in periods 1 and 2 respectively. Betty earns £147 in period 1 and she will earn £63 in period 2. Betty can borrow or lend at an interest rate of 10%. There is no inflation. What will be Betty's choice? How much will she borrow/save? Draw Betty's indifference curves and budget constraint, clearly indicating relevant slopes and Betty's choice, clearly indicating the x-axis and y-axis.

[6 marks]

Question 5

Define a natural monopoly and explain why natural monopolies often emerge in industries like utilities (e.g., electricity, water supply).

[6 marks]

Question 6

Use a cost and revenue diagram to compare the production costs of a natural monopoly with that of multiple firms in the same industry.

[6 marks]

Question 7 [32 marks]

A monopolist faces the following market demand curve:

$$Q=100-2P$$

where Q is the quantity demanded, and P is the price. The monopolist's total cost function is:

$$TC=20Q+100$$

a. Explain why a monopolist charges a price higher than marginal cost. How do the market outcomes differ from those under perfect competition?

[6 marks]

b. Find the profit-maximising price and quantity for the monopolist. Show all your calculations.

[6 marks]

c. Draw a diagram and show the consumer surplus and producer surplus at the monopoly price and quantity found in (b).

[6 marks]

d. Calculate the values of consumer surplus and producer surplus in (c). Show your calculations.

[7 marks]

e. Discuss how the monopolist could increase its profits by charging different prices to different groups of consumers. Provide a real-world example of this pricing strategy.

[7 marks]

Question 8 [32 marks]

A firm produces output (Q) using two inputs: labour (L) and capital (K). The firm's production function is given by:

$$Q=10L^{2/3}K^{1/3}$$

The firm currently faces the following costs:

The cost of labour is £15 per unit of labour.

The rental rate of capital is £40 per unit of capital.

a. Does the production function exhibit increasing, constant, or decreasing returns to scale? Justify your answer mathematically.

[6 marks]

b. Find the marginal product of labour (MPL) and marginal product of capital (MPK). Use these results to explain whether the firm experiences diminishing marginal returns to labour and capital. Interpret the economic meaning of your answer

[6 marks]

c. If the firm wants to produce 100 units of output, what combination of L and K minimises costs?

[6 marks]

d. Suppose the government introduces a labour subsidy that effectively reduces the wage rate from £15 to £10 per unit of labour. How will this policy affect the firm's optimal input combination (L,K)? Explain the intuitive economic reasoning behind how the firm's production decision changes in response to the new wage rate.

[7 marks]

e. Will the total cost of producing 100 units increase, decrease, or stay the same? Support your answer with economic reasoning (not mathematically).

[7 marks]

End of Examination/ Leon Vinokur