Economics

Paper 1

Microeconomics

Imperial Secondary Examinations Authority
December 1919 examinations

Answer questions in the space provided. *If maths are required, show your working.* If you require more space, attach with Treasury tag a piece of paper to this examination, clearly number where you left off, and provide cross-reference to the page where further work is located.

Do not write on the back of examination materials.

You will receive no marks if you interfere with the scoring box at the bottom of this page.

Institution: _____

Examinations code: _____

Do not make marks in this table.

Page	1	2	3	4	5	6	7	8	Total
Marks	6	10	4	5	10	3	4	8	50
Score									

1. (6 marks) Why might a communally owned resource be overused? Express graphically, mathematically, and verbally.

2. A quartermaster in the British Navy is assigned the duty of purchasing steel and hiring workers so that the Navy can build ships. Assume that building ships follows the following production function—

$$S = M^{\alpha} L^{1-\alpha}$$

S is the number of ships, M is the amount of steel used, and L is the amount of labour purchased.

(a) (10 marks) Find the conditional inverse demand function for labour, expressed in terms of parameters and the prices of steel and labour.

(b) (4 marks) Prove that no total demand function exists.

(c) (1 mark) What are the returns to scale for this producer?

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(d) (4 marks) What does the non-existence of a total demand function imply about market supply, production decision, and market entry?

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3. Certain types of haruspicy require chickens. Citizens purchase chickens for haruspices based on the following function—

$$P_c = 100 - 3Q_c$$

Chicken farmers sell chickens on the following function—

$$P_c = 10 + 4Q_c$$

(a) (2 marks) Determine the marginal benefit and marginal cost of haruspicy.

(b) (3 marks) Find the equilibrium quantity and price in this market.

(c) (5 marks) If the haruspices impose a tax of 2 pounds sterling for each chicken sacrificed to the gods, what impact does this have on the quantity and prices of chickens?

(d) (3 marks) How much value is foregone by the imposition of this tax? Show mathematically and illustrate this graphically.

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4. (4 marks) Why might a firm with high transport costs underestimate the potential for market entry based on historical data?

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5. Suppose the cost of political agitation is given by the following equation—

$$C_a = 10 + \gamma H$$

Where γ is some coefficient and H is the number of hungry *proletarii* in the city. The city has a population of 100.

(a) (1 mark) If grain G is provided and perfectly distributed to the people such that each unit of grain satisfies the hunger of one *proletarius*, express the cost of political agitation in terms of parameters and grain provided.

(b) (1 mark) If grain's supply function is determined by $Q_g = 15P_g^2 + 20$, find the marginal cost of grain.

(c) (4 marks) Suppose that the state purchases grain for the consumption of the *proletarii*. Find an expression for the optimal amount of grain to purchase.

(d) How might this optimal amount change—

i. (1 mark) if the value γ increased?

ii. (1 mark) if the population of the city doubled?