

**AY2026 Entrance Examination for the Master's Program,
Graduate School of Bioagricultural Sciences, Nagoya University**

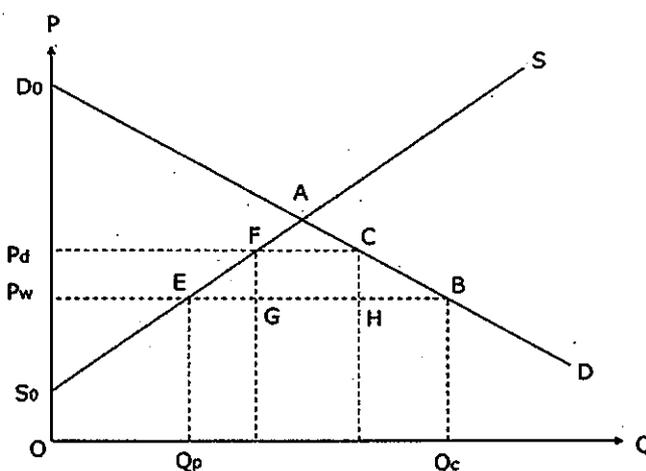
Subject chosen	Food Economics	For this subject. Total pages (1) Page number (1)
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Q1. Explain the following terms briefly. You may use diagrams etc. if necessary.

- (1) Income Elasticity of Demand
- (2) Direct Payment Policy
- (3) Multifunctionality in Agriculture
- (4) Agribusiness
- (5) Opportunity Cost

Q2. Answer the following questions.

- (1) Rice price has risen sharply since last year in Japan, becoming a serious social issue. Explain the reasons for the rise in rice price, and describe your thoughts on policies to stabilize rice price.
- (2) When border measures or subsidy policies are implemented to maintain a higher domestic price (P_d) relative to the international price (P_w), describe the effects on producer surplus, consumer surplus, government revenue (from custom duties) or government expenditure (for subsidies), and total social surplus in the diagrams, in order to compare the advantages and disadvantages of border measures and subsidy measures respectively. In this diagram, DD_0 represents the demand curve, SS_0 represents the supply curve, and point A is the equilibrium under free trade conditions.



- (3) Farming production cost per area decreases as the farming area increases.
 - ① Identify three typical mechanisms through which economies of scale arise in agricultural production.
 - ② Explain why farm expansion does not always proceed, considering technical and social factors.

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Intention of the Question

Q1

Tests basic knowledge of general economics and agricultural economics

Q2

Tests the ability to understand and consider social issues related to food and agriculture

Model Answers

Q1. Explain the following terms briefly. You may use diagrams etc. if necessary.

(1) Income Elasticity of Demand

The ratio of proportional increase in quantity demanded to proportional increase in income, with all prices held constant. If M is income and X the quantity demanded then the income elasticity of demand, ϵ_M , is defined by

$$\epsilon_M = (\partial X / X) / (\partial M / M).$$

If $\epsilon_M > 1$, a higher proportion of income is spent on luxuries as income rises.

If $1 \geq \epsilon_M \geq 0$, as income rises, spending on a necessity rises, but the proportion of income spent on it falls.

If $0 > \epsilon_M$, as income rises, spending on inferior goods falls.

(2) Direct Payment Policy

The direct payment policy in agriculture refers to a system where farmers receive funds directly for maintaining their farming activities. Direct payment policy has been introduced as a way to protect farmers without distorting the market, and is also used to encourage appropriate agricultural practices, such as environmentally friendly agriculture.

(3) Multifunctionality in Agriculture

Multifunctionality in agriculture refers to the non-trade benefits of agriculture, that is, benefits other than commerce and food production such as environmental protection, landscape preservation, rural employment, food security and so on.

(4) Agribusiness

Agribusiness refers to the entire value chain related to food and agricultural products, including input supply, production, processing, distribution, and marketing. It emphasizes agriculture as an industrial system and is essential for analyzing market structures and corporate strategies.

(5) Opportunity Cost

Opportunity cost is the value of the next-best alternative forgone when a resource is used in a particular way. In agriculture, examples include the off-farm wage that family labor could earn elsewhere, rental income

forgone by using one's own land, and alternative returns on capital. Considering opportunity costs allows farm managers to make more economically rational decisions.

Q2. Answer the following questions.

- (1) Rice price has risen sharply since last year in Japan, becoming a serious social issue. Explain the reasons for the rise in rice price, and describe your thoughts on policies to stabilize rice price.

The supply and demand balance for rice was disrupted, and rice prices soared as supply fell short of demand. Rice is a necessity, so even a small change in quantity can cause large price fluctuations in the market. The direct cause of the supply shortage was the government's mistaken prediction of supply and demand condition and its failure to adjust supply and demand. However, a larger cause was the aging and declining number of farmers, which led to the deterioration of farmland and a decline in rice productivity. In order to stabilize rice prices, it is necessary to restore rice productivity by securing farmers and improving the farmland infrastructure. In addition, appropriate market intervention and flexible management of rice stockpiles by the government are required.

- (2) When border measures or subsidy policies are implemented to maintain a higher domestic price (P_d) relative to the international price (P_w), describe the effects on producer surplus, consumer surplus, government revenue (from custom duties) or government expenditure (for subsidies), and total social surplus in the diagrams, in order to compare the advantages and disadvantages of border measures and subsidy measures respectively. In these diagrams, DD_0 represents the demand curve, SS_0 represents the supply curve, and point A is the equilibrium under free trade conditions.

When domestic and international prices are equal under free trade conditions, producer surplus is represented by EP_wS_0 , consumer surplus by BP_wD_0 , and thus total social surplus by BD_0S_0E .

If a tariff is imposed and the domestic price becomes P_d , the equilibrium for consumption shifts to C and the equilibrium for production shifts to F. Consequently, producer surplus increases by FP_dP_wE to become FP_dS_0 , and consumer surplus decreases by CP_dP_wB to become CP_dD_0 . $CFGH$ constitutes tariff revenue. When this is added, total social surplus decreases by $FEG + CHB$ compared to the total surplus under free trade.

If a subsidy is granted and the domestic price becomes P_d , the equilibrium for production shifts to F and thus producer surplus increases FP_dP_wE to become FP_dS_0 . As trade remains free, the equilibrium consumption remains at B, and consumer surplus remains BP_wD_0 . FP_dP_wG constitutes fiscal expenditure. When this is added, total social surplus decreases by FEG compared to the total surplus under free trade.

Given the above, although subsidy measures have the same protective effect for producers as border measures, they do not disadvantage consumers and result in a smaller loss of total social surplus. In contrast, border measures have the advantage of imposing less fiscal expenditure than subsidies.

- (3) Farmer A's average costs decrease as he increases the area cultivates.
- ① Identify three typical mechanisms through which economies of scale arise in agricultural production.
 - ② Explain why farm expansion does not always proceed, considering technical and social factors.

① Sources of Economies of Scale

- i Spreading fixed costs: Large machinery and facilities can be allocated across more land area, reducing average cost.
- ii Improved labor productivity: Specialization and efficient mechanization lower labor input per unit

area.

- iii Cost-effective adoption of advanced technologies: Precision agriculture and ICT systems are more efficient when implemented over larger operations.

② Why farm expansion does not always proceed

Technically, farmland fragmentation, irregular field shapes, and water management constraints reduce efficiency gains. Socially, landownership fragmentation and community customs hinder consolidation. Moreover, price volatility and production risks discourage large-scale investment.