令和8年度特色入試問題

《農学部 食料・環境経済学科》

小論文試験

200点満点

(注 意)

1. 問題冊子および解答冊子は係員の指示があるまで開かないこと。
2. 問題冊子は表紙のほかに12ページある。
3. 解答冊子は表紙のほかに，下書き用紙を含め10ページある。
4. 試験開始後，解答冊子の表紙所定欄に受験番号・氏名をはっきり記入すること。
   表紙には，これら以外のことを書いてはならない。
5. 解答はすべて解答冊子の指定された箇所に記入すること。
6. 解答に関係のないことを書いた答案は無効にすることがある。
7. 解答冊子は，どのページも切り離してはならない。
8. 問題冊子は持ち帰ること。解答冊子は持ち帰ってはならない。
9. 解答は日本語で記入すること。

1 以下の英文を読んで問１～問６に答えなさい。（100 点）

An integral part of the structural reforms of the 1980s and the 1990s was the systematic opening up of Asian economies, internally through deregulation and privatization and externally through liberalization and import tariff reduction leading to global trade integration. The resulting globalization or the intensification of political, social, economic, and cultural linkages and the transfer of behaviors of individuals and societies to the rest of the world had significant effects on global food systems. The third phase of food systems transformation[*1], beginning in 2000, was characterized by three globalization developments. First, ①the emergence of foreign direct investment (FDI)[*2] in organized retail[*3] in foods and the proliferation[*4] of regional and international supermarkets. Second, a nutritional transition characterized by ② the increased availability and consumption of processed food products channeled through organized retail and changing consumption patterns among urban and rural populations. Third, the public health challenge of ③rising noncommunicable diseases[*5] resulting from the nutritional transition.

The entry of Asian countries into the World Trade Organization (WTO) and the signing of the Agreement on Agriculture (AoA) under the General Agreement on Tariffs and Trade (GATT) set guidelines for the reduction of tariffs and trade protection. The easing of trade restrictions coupled with increased FDI in retail in the late 1990s and 2000s led to an accelerated emergence, consolidation[*6], and multi-nationalization of the supermarket sector. The "supermarket revolution" occurred in different periods in Asia. Thailand, Malaysia, and Indonesia saw the rise of supermarkets in the mid and late 1990s, while India, China, and Vietnam followed in the first decade of the 2000s. In contrast, the food retail sector in Bangladesh has been growing slowly compared to its regional neighbors. In 2000, FDI in food retail made up only 0.3% of total FDI, which rose to 3% in 2017.

In the second decade of the 21st century, the rate of growth of late starters exceeded that of early starters (except in Malaysia). Between 2015 and 2020, modern retail stores grew on an average of 4.5% Compounded Annual Growth Rate (CAGR)[*7] in India and China, 33.8% in Vietnam, and 7% in Malaysia (Table 1). Bangladesh has lagged in modern retail investments. Domestic policies incentivized[*8] FDI in retail; these included quality and safety standards and hygiene[*9] regulations for markets for fresh produce, investments in midstream of agricultural value chains in the form of wholesale markets, logistics, and processing, and the emergence of contract farming. Despite these investments and pro-active[*10] policies, in many countries, like India, there are still

significant gaps between farms and market linkages.

In the second phase, while Asia witnessed an income-induced diet diversification away from staple grains, the third phase saw diet globalization and westernization. Global trade integration opened the Asian market to temperate-zone[*11] products (such as apples and specialty fruits) and semi and ultra-processed foods and beverages. While modern grocery stores became a conduit[*12] to bringing semi and ultra-processed foods to predominantly urban masses, traditional retail stores (referred to as mom and pop stores) also began channeling processed foods to rural populations in developing countries. In the decade between 2011 and 2021, all major Asian economies saw an increase in the sales of processed foods. However, lower-middle-income countries such as India, Bangladesh, Indonesia, and Vietnam saw higher growth rates in processed foods sales than middle-income countries such as Malaysia, Thailand, and China. The sale of processed foods grew between 9% and 17% (CAGR) in lower-middle-income countries and between 5% and 7% in middle-income countries.

Economic development resulting from agricultural transformation reduced hunger in all Asian countries. Consequent income growth and poverty reduction also led to a decline in malnutrition[*13] trends across lower-middle-income and middle-income countries. In 2001, the malnourished population in India, Bangladesh, Indonesia, Thailand, and Vietnam averaged between 16 and 20%. In the subsequent two decades, there has been considerable divergence in the reduction of malnutrition. While Vietnam, Thailand, and Indonesia saw a decline in malnutrition by –6.43%, –3.62%, and –4.39% CAGR between 2001 and 2018, India and Bangladesh fared lower[*14] with –1.66% and –1.21%, respectively. In Asia, China saw the highest reduction in malnutrition at a CAGR of –8.15 between 2001 and 2018. Interestingly, the rate of decline in malnutrition did not conform to the income level of countries, as we see Indonesia and Vietnam seeing rates of reduction like middle-income countries. The levels of malnutrition remain the highest in South Asia.

Concurrent with[*15] the reduction in malnutrition, obesity[*16] rates, and the prevalence of other diet-related noncommunicable diseases have been on the rise. The nutrition transition, from under-nutrition to over-nutrition and obesity, was ushered in[*17] by income growth, the shift from low to high-calorie diets, and the increased intake of processed foods. Obesity and increased incidence of noncommunicable diseases are not just urban challenges, as rural areas in low and middle-income countries are witnessing a rapid rise in obesity due to the proliferation of access to processed and ultra-processed foods. The growth rate in obesity has averaged between 6% and 9% CAGR in all major Asian economies between 2001 and 2016. In countries like India and Bangladesh,

④the triple burden of malnutrition or the coexistence of hunger, micronutrient*18 malnutrition, and obesity is a clear and present public health challenge as malnutrition remains stubbornly*19 high compared to other economies in the region, and obesity continues to rise.

Global trade integration opened the Asian market to new foods, and semi and ultra-processed products and beverages, and modern grocery retail stores became a conduit for a nutritional transition. While all Asian countries successfully reduced their levels of malnutrition, dietary changes have also led to rising levels of obesity. While the problems of hunger and micronutrient malnutrition persist, the burden of noncommunicable diseases is on the rise leading to many Asian economies being saddled with the triple burden of malnutrition.

出典：Pingali, P. and Abraham, M., 2022, 'Food systems transformation in Asia - A brief economic history', *Agricultural Economics*, 53(6), pp.895-910 の Section 4 (pp.901-903) を一部改変。

（語注）*1 the third phase of food systems transformation 筆者はフードシステムの変容を 1960～1980 年、1980～2000 年、2000～2020 年、2020 年以降の 4 期に区分している、*2 foreign direct investment (FDI) 海外直接投資、*3 organized retail （小売チェーンなどの比較的規模の大きい）小売企業、*4 proliferation 急増、*5 noncommunicable diseases 非感染性疾患、*6 consolidation 統合（とくに新設合併）、*7 Compounded Annual Growth Rate (CAGR) 年平均成長率、*8 incentivize 動機を与える、*9 hygiene 衛生、*10 pro-active 先を見越した、*11 temperate-zone 温帯の、*12 conduit 導くもの、*13 malnutrition 栄養不良（不足・過多）、*14 fare lower 低調である、*15 concurrent with ～と同時に、*16 obesity 肥満、*17 usher in ～を招き入れる、*18 micronutrient 微量栄養素の、*19 stubbornly 頑として

Table 1. Increase in modern grocery in selected Asian countries

	Number of modern grocery retail			
	2015	2018	2020	CAGR
Bangladesh	453	501	532	3.2%
Malaysia	7399	9052	10394	7.0%
Vietnam	1610	4270	6905	33.8%
Thailand	1520	1840	1970	5.3%
Indonesia	28300	35100	38700	6.5%
India	6200	7300	7900	5.0%
China	228400	259800	284200	4.5%

Source: Pingali, P. and Abraham, M., 2022, 'Food systems transformation in Asia - A brief economic history', *Agricultural Economics*, 53(6), pp.895-910 の Table 1 より一部抜粋、一部改変。Data Source: Euromonitor.

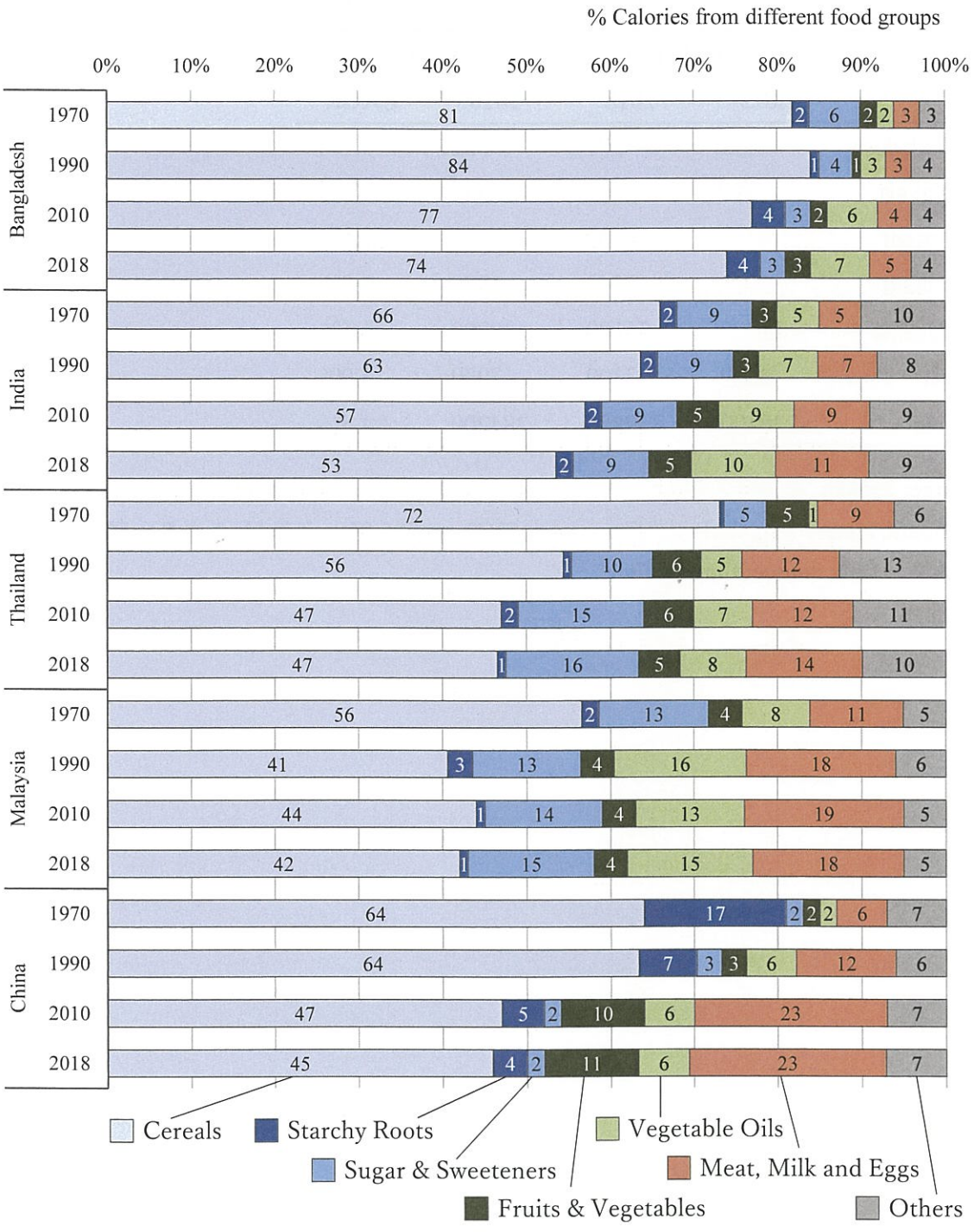

Figure 1. Percentage of calories from various food groups in selected countries (1970–2018)

Source: Pingali, P. and Abraham, M., 2022, 'Food systems transformation in Asia - A brief economic history', *Agricultural Economics*, 53(6), pp.895-910 の Figure 3 を基に作成。

Note: 図中の数値の表記は Pingali and Abraham (2022)の Figure 3 にしたがう。

問１　下線部①の現象について、FDI がどのように促されどのような結果をもたらしたのかという観点から、本文をもとに説明しなさい。

問２　下線部②について、どのような食品が、都市と農村でどのような形態で普及したのか、本文をもとに具体的に説明しなさい。

問３　下線部③は、どのようにもたらされたのか、本文をもとに説明しなさい。

問４　下線部④に関して、以下の問いに答えなさい。

（１）　the triple burden of malnutrition とは具体的に何を指すのか、説明しなさい。

（２）　the triple burden of malnutrition が生じる背景にはどのような社会経済的状況が想定されるか。本文の内容を手掛かりに、あなたの考えを述べなさい。

問５　Figure 1 は、1970 年から 2018 年までの、アジア各国における食品群別摂取量（熱量比）の推移を表している。この表からアジアにおける食生活の変化として読み取れることを、本文の内容と Table 1 を踏まえて説明しなさい。

問６　本文で論じられた小売および消費段階の変化は、農業や食品加工・製造業、流通業にどのような影響をもたらしたと想定されるか。あなたの考えを述べなさい。

2 以下の英文を読んで問１～問６に答えなさい。（100 点）

The ①Gini coefficient*1, or Gini index, is the most commonly used measure of inequality. It was developed by Italian statistician Corrado Gini (1884–1965) and is named after him. It is typically used as a measure of income inequality, but it can be used to measure the inequality of any distribution — such as the distribution of wealth or even life expectancy. It measures inequality on a scale from 0 to 1, where higher values indicate higher inequality. This can sometimes be shown as a percentage from 0 to 100%, called the "Gini Index". A value of 0 indicates perfect equality: everyone has the same income. A value of 1 indicates perfect inequality, where one person receives all the income, and everyone else receives nothing.

How is the Gini coefficient calculated?

There are two main ways of calculating the Gini coefficient. ②Both arrive at the same value, but they provide us with two different angles for understanding what it measures.

Method 1: The Gini tells us the difference we expect to find between any two people's incomes relative to the mean

The first method can be illustrated with the following thought experiment. Imagine two people bumping into each other in the street at random. They compare their incomes and find out how rich one person is compared to the other. How big a gap would we expect there to be? This expected gap between two randomly chosen people is what the Gini coefficient measures. It is calculated by taking the average gap between all pairs of people. Where incomes are distributed equally, we expect the gap between two randomly selected people to be small. Where inequality is high, we expect the gap to be large. However, if measured in absolute terms, this will also depend on how rich or poor the population is generally. Where even the most well-off in society have a low income, the absolute gap between people's incomes cannot be high. Conversely, where incomes are generally high, even very small relative differences between people's incomes can result in large absolute gaps. For this reason, the Gini coefficient expresses the expected absolute gap between people's incomes relative to the mean income in the population. In particular, it is calculated as the expected gap as a share of twice the mean income. Twice the mean income is the highest possible value for the average gap — a situation of perfect inequality, where one person has all the income and everyone else has none. So in this case of maximum inequality, the Gini coefficient is 1. The lowest possible value for the average gap between all pairs of people is zero—a situation of perfect

equality, where there are no gaps between any two people's incomes because everyone earns the same. In this case, the Gini coefficient is 0.

Method 2: The Gini tells us how far the "Lorenz curve" falls from perfect equality

Figure 1 illustrates a second visual definition of the Gini coefficient. The left panel shows the share of income received by each fifth of a hypothetical population. The right panel shows this data plotted cumulatively[3*]. This is known as a "③Lorenz curve". In a population where income is shared perfectly equally, the Lorenz curve would be a straight diagonal line[*2]: 10% of the population would earn 10% of the total income, 20% would earn 20% of the total income, and so on. This is shown in Figure 1 as the "line of equality". In the hypothetical population shown in the figure, though, incomes are not distributed equally. The bottom 60% of the population earns 30% of the total income. The Gini coefficient captures how far the Lorenz curve falls from the "line of equality" by comparing the areas A and B, as calculated in the following way:

Gini coefficient = A / (A + B)

The Lorenz curve is the "line of equality" where incomes are shared perfectly equally. Area A is 0, and hence so is the Gini coefficient. Where one person has all income and all others receive no income, the Lorenz curve will run along the bottom axis of the figure — the cumulative share of income is zero until the very last person. Area B will be zero, and the Gini coefficient will equal 1.

Comparing measures: Does the Gini tell the same story as other inequality measures?

A measure of inequality summarizes how spread out the distribution is — just like the standard deviation, which you may have learned about in school. ④Implicit in such summary measures are judgments about what should count most when measuring inequality. For example, compare two hypothetical populations. In one, the rich are much richer than those in the middle, but the incomes of poorer people are only a little below those in the middle. In another, there is the opposite situation: the incomes of the rich are only a little above those in the middle, but the poor are much poorer. In which population would you say inequality is highest? Your answer will depend on your personal judgments about how these gaps in different parts of the distribution compare in terms of their contribution to inequality overall. Such value judgments are implicitly built into the mathematical definition of an inequality measure. That is true of all inequality measures, and the Gini coefficient is no exception. One property of the Gini,

compared to other inequality metrics, is that it is more sensitive to changes around the middle of the distribution than at the very top and bottom. You can see this from the examples in Figure 2. For four countries, it shows how the Gini compares to two other inequality measures: the share of income received by the richest 10% and 1%, respectively. To make more direct comparisons, the figure shows the relative change in each measure over time. We see that modest relative changes in the Gini coefficient can be accompanied by much more substantial relative changes in the share of income received by the richest 1%. That is true where inequality is rising (as in the United States) and where inequality is falling (as in Uruguay). In contrast, the Gini coefficient tracks the top 10% share of income much more closely. The Gini's lack of sensitivity to changes at the top of the distribution is mostly a matter of concern for the very top.

出典：Hasell, Joe, 2023, Measuring inequality: what is the Gini coefficient? Published online at OurWorldinData.org. Retrieved from: https://ourworldindata.org/what-is-the-gini-coefficient（2025 年 6 月 5 日参照）を一部改変。

（語注）*1 coefficient 係数、*2 diagonal line 対角線、*3 cumulatively 累積的に

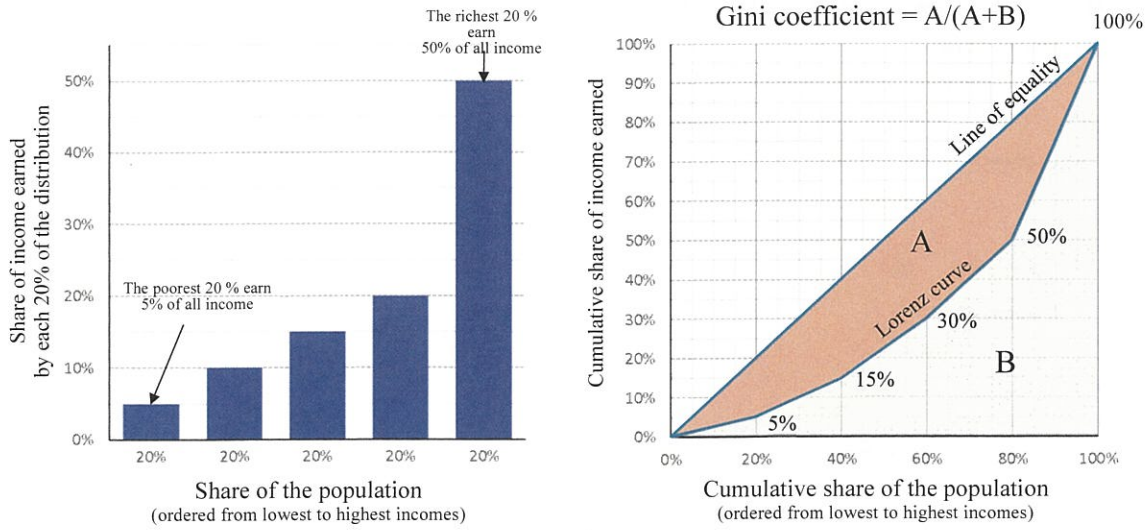

Figure 1. Visual explanation of the Gini coefficient

Note: The bar chart on the left shows a simple distribution of incomes. The total population is split up in 5 parts and ordered from the poorest to the richest 20%. The bar chart shows how much income each 20% part of the income distribution earns. The chart on the right shows the same information in a different way, both axis show the cumulative shares. The poorest 20% of the population earn 5% of the total income, the next 20% earn 10% — so that the poorest 40% of the population earn 15% etc. The curve resulting from this way of displaying the data is called the Lorenz Curve. If there was no income inequality, the resulting Lorenz Curve would be a straight line — the "Line of Equality". A larger area (A) between the Lorenz Curve and the Line of Equality means a higher level of inequality. The ratio of A/(A+B) is therefore a measure of inequality and is referred to as the Gini coefficient, Gini index, or simply the Gini.

（図注）右図の A 及び B は領域とともに面積を表す。パーセント（0～100%）は割合（0～1）に対応することに注意すること。

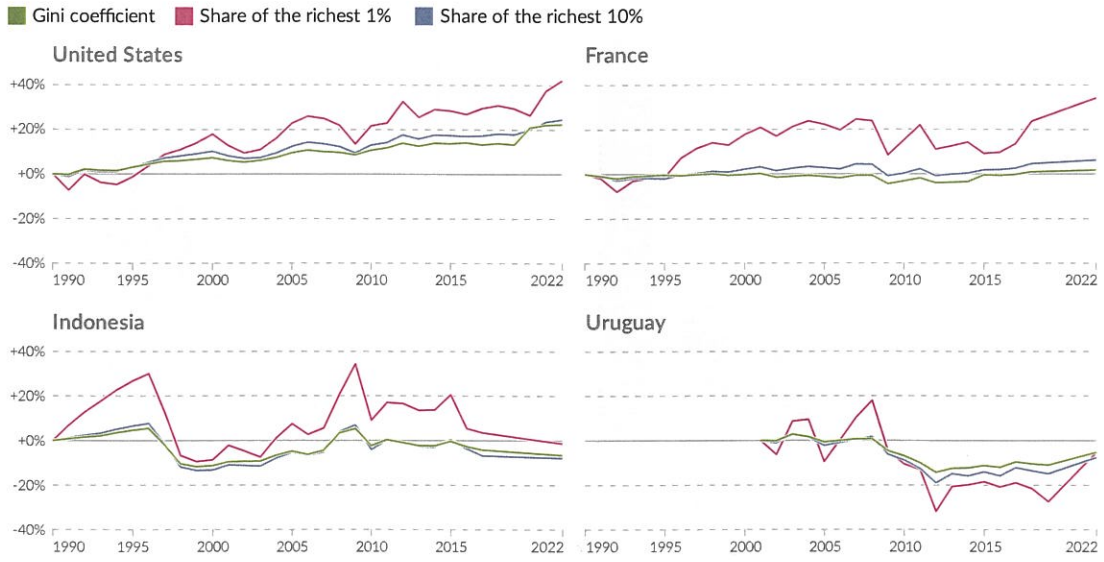

Figure 2. Proportional change in three inequality metrics

Data source: World Inequality Database (https://wid.world/)

Note: The percentage change relative to initial levels (in 1990, or 2001 for Uruguay). For example, a change in Gini from 0.4 to 0.5 would be shown as +25%. The measures relate to inequality of incomes before taxes and benefits. Income is measured before payment of taxes and non-pension benefit, but after the payment of public and private pension.

問1　下線部①の“Gini coefficient”（ジニ係数）がどのような尺度か説明しなさい。

問2　Figure 1 のケースについて本文中の Method 2 を用いてジニ係数を計算しなさい。

問3　ある集団は年間所得が 1 万ドルのグループと 3 万ドルのグループで構成され、各グループはそれぞれ集団全体の 50%を占めるとする。このケースで、下線部②が示すように本文中の Method 1 と Method 2 の結果が同じになることを示しなさい。

問4　下線部③の“Lorenz curve”（ローレンツ曲線）について以下の問いに答えなさい。

（1）　ローレンツ曲線は増加関数かつ下に凸となる。その理由を説明しなさい。

（2）　ローレンツ曲線が以下のような関数で表されるとする。

$$y = \frac{x^2 + 1 - \sqrt{1 - x}}{2}$$

ここでxを Cumulative share of the population、yを Cumulative share of the income earned とする（Figure 1 を参照のこと）。ただし、$0 \leqq x \leqq 1$とする。この関数が増加関数かつ下に凸となることを示しなさい。

（3）　（2）のローレンツ曲線について、ジニ係数を計算しなさい。

問5　下線部④の文章の意味を説明した上で、ジニ係数の特徴と利用上の注意点について Figure 2 を参照しながら説明しなさい。

問6　国の経済発展とジニ係数の関係は一般的にどのようになるか。あなたの考えを述べなさい。

令和８年度 特色

問題訂正

農学部食料・環境経済学科　小論文試験

下記の問題訂正があります。

記

問　題　訂　正

農学部 食料・環境経済学科 小論文試験　問題冊子

2

８ページ　６行目

（誤）cumulatively[3*]

↓

（正）cumulatively[*2]

８ページ　８行目

（誤）diagonal line[*2]

↓

（正）diagonal line[*3]

2

９ページ　語注

（誤）*2 diagonal line 対角線、*3 cumulatively 累積的に

↓

（正）*2 cumulatively 累積的に、*3 diagonal line 対角線

以上