Instructions: Please answer all questions in the blue books. You may not use notes, books, or calculators. Please show your work. There are 15 questions, for a total of 100 points. Questions vary in their level of difficulty. I have tried to put harder questions at the end. Partial credit will be given for partially correct answers. Good luck!

1) [5 points] Briefly define the term “kleptocracy.”

2) [5 points] Briefly explain the “cost disease” as described by the economist William Baumol.

3) [6 points] During the last century, the amount of discrimination against ethnic and racial minorities in the United States has fallen significantly. How might this reduction in discrimination have affected efficiency of production? Be as explicit as possible in linking your answer to the types of inefficiency discussed in the textbook.

4) [6 points] Suppose that the colleges of the Ivy League decided to ditch their current admissions policies, which focus primarily on student quality. Instead, the colleges decide to base their admissions on a lottery system. They will continue to offer excellent education, however. How might this change in policy be expected to affect the Gini coefficient, once the new cohorts of graduates have entered the labor market? Explain.

5) [5 points] “Mean household income in the United States is roughly equal to the income of the household in the XXth percentile of the income distribution” (Note: the first percentile is the poorest 1 percent, and so on.)

Which of the following is most likely the correct value for XX: 40, 50, or 60? Explain your answer.

6) [5 points] In a certain country, there are two ethnic groups, A and B. Two thirds of the population belongs to group A and one third of the population belongs to group B. What is the country’s index of ethnic fractionalization?
7) [8 points] As noted in the textbook, there is a strong correlation between a country’s distance from the equator and the level of GDP per capita.

A) [4 points] Discuss a theory that explains this correlation and further implies that the effect of distance from the equation on relative income might be just as significant in the future as it is today.

B) [4 points] Discuss a theory that explains this correlation and further implies that the effect of distance from the equation on relative income should be expected to diminish in the future.

8) [8 points] Over the last century, there has been very little technological advance or productivity growth in the men’s haircut industry. By contrast, there has been enormous technological advance in farming. Despite this, the wages of barbers relative to farmers have stayed roughly constant.

A) [4 points] Explain how this happened.

B) [4 points] A friend of yours, hearing about this fact says “Well, surely this must have to do with the price elasticity of demand for food relative to the price elasticity of demand for haircuts.” You answer: “Actually, it has nothing to do with the price elasticity of demand for food relative to that for haircuts. What those price elasticities did affect was __________.” Complete the sentence in a few words and then add a few more sentences explaining your statement.

9) [8 points] In lake A, the only kind of fish is catfish. In lake B, the only kind of fish is tilapia. The equations describing the rate at which the fish grow are as follows:

Catfish: \[ G_t = \frac{S_t \times (100-S_t)}{100} \]

Tilapia: \[ G_t = \frac{S_t \times (100-S_t)}{200} \]

A) [4 points] For which fish is the optimal stock of the fish higher?

B) [4 points] Calculate the maximum sustainable yield for each fish.
10) [6 points] Air pollution can be of two types: indoor (from cooking fires and lighting) and outdoor (from sources that are vented outside the home as well as industrial production, automobiles, and so on). How would you expect the environmental Kuznets curves for these two types of pollution to compare to each other? Briefly explain.

11) [8 points] Consider the two country model of technology transfer from Chapter 9. Suppose that initially the world is in steady state, with Country 1 as the technology leader, Country 2 as the technology follower, and the ratio of technology the leader to technology in the follower constant. Now suppose that there is a sudden reduction in the cost of copying.

A) [4 points] What are the long and short run effects of this change on the rate of output growth in Country 1?

B) [4 points] What are the long and short run effects of this change on the rate of output growth in Country 2?

12) [6 points] A country is ruled by a wise, unselfish, absolute dictator. The government collects a tax on wages and spends the money on a public good. There is no corruption, nor are there any political considerations regarding how much of the public good the government produces.

How would the amount of the public good supplied by this dictator compare in the case where labor is supplied inelastically vs. the case where the labor supply curve is upward sloping? Explain your answer.

13) [6 points] A group of economically similar countries are united in an economic union in which there are no restrictions on movement of labor or capital among them. Suppose that by its nature, capital is more internationally mobile than is labor. Every country in the economic union sets its own taxes on capital and labor and supplies its own public good. Now, however, the countries are thinking of making their union stronger by setting common taxes on capital and labor and jointly supplying public goods.

How would this change affect the propensity of the government to tax capital vs. labor? How would the change be expected to affect income distribution?
14) [6 points] In the textbook’s discussion of Jared Diamond’s theory from *Guns, Germs, and Steel* I write, “The availability of food crops and domestic animals in Europe and Asia allowed for more efficient food production, denser populations, and the rise of advanced civilizations. Surplus food could support a large class of rulers, priests, and warriors.” In subsequently thinking about this statement from a Malthusian perspective, I decided that maybe it was stupid. Explain why I came to that view.

15) [12 points] Consider two countries described by the Solow model with no population growth, technological change, or international capital flows. The two countries have the same values of $A$ (productivity), $\gamma$ (the saving rate), and $\delta$ (the deprecation rate). The production function in both countries is (in per capita terms)

\[ y = Ak^\alpha \]

Prior to the year 2000, both countries are in steady state.

In the year 2000, Country 1 doubles its level of productivity, holding the saving rate constant, while Country 2 doubles its saving rate, holding the level of productivity constant.

A) [4 points] How will the new steady state levels of capital per worker compare in the two countries?

B) [4 points] How will the levels of output per worker that are observed immediately following the change (that is, before any capital has accumulated) compare?

C) [4 points; hard!] Draw a picture with time on the horizontal axis and the logarithm of output per worker on the vertical axis, showing how output per worker will evolve over time in the two countries (starting before 2000 and continuing until they are approaching steady state). On this figure you should carefully note any important features. You may also want to include a standard picture of the Solow model in order to explain your answer.