Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Economics of Development

Spring 2023 Exam One

Total exam is worth 30 points. Each question is worth three points. Each sub-question is worth an equal share of the three points for that question.

1. Growth models
   1. Present and contrast the production function specified in of the Solow model with that of the Romer model.

* 1. Describe the nature of the positive spillover proposed by the Romer model and explain how it can explain a failure to find unconditional convergence.
  2. In what sense is the Romer model an endogenous growth model?

1. Big Push Model.

Output

Labor

Current production uses the traditional production, revenue, and cost function to have 600 workers make 600 units of output, where each worker is paid a wage of 1 and each unit of output is sold at a price of 1.

1. Will coordination be needed to have all N sectors in the economy modernize if the modern wage is represented by modern cost (wage) 1? Why or why not?
2. Will coordination be needed to have all N sectors of the economy modernize if the modern wage is represented by modern wage 2? Why or why not?
3. What is the nature of the spillover benefit to the other N-1 sectors of the economy of the sector represented in the figure modernizing?

1. Exchange Rates
   1. Illustrate on a supply and demand graph for US dollars the impact of an overvalued domestic currency. The y axis is the price in domestic currency per $.
   2. If this currency is devalued to the market clearing price in local currency per $, will the prices of exports from the country increase or decrease in world markets? Why?
2. Growth models
3. Write out the equation for income growth according to the Harrod Domar model. Define each term in this equation, then explain what can be changed in this equation to increase the rate of income growth.
4. Why did Solow state about the Harrod Domar model that “An expedition from Mars arriving on Earth, having read this literature, would have expected to find only the wreckage of a capitalism that had shaken itself to pieces long ago. Economic history was indeed a record of fluctuations as well as of growth, but most business cycles seemed to be self-limiting. Sustained, though disturbed, growth was not a rarity.”
5. Circle to indicate whether the statement is true or false.

|  |  |
| --- | --- |
| **Statement** | **Is the statement True or False?** |
| The Harrod Domar model specifies diminishing marginal returns to capital in the production of output. | True or False |
| Sen identifies one of the main themes of the first generation of development economics is the importance of identifying a country’s comparative advantage. | True or False |
| Neutral technological progress leaves unchanged the marginal rate of technical substitution for a given input bundle on an isoquant, while increasing the amount produced by the given input bundle. | True or False |
| The “O-Ring” theory is based on their being strong substitutability between different kinds of workers in the production of output. | True or False |
| Developing countries are defined as being in the lower and middle-income groups using the World Bank Atlas measure of GNI per capita. | True or False |
| Transfer pricing is using your monopoly status in your home country to subsidize exports in an effort to drive competition in other countries out of business. | True or False |
| Solow designed his model to explain the cross-country evidence suggesting there is ‘conditional convergence’ across countries in income per capita over time. | True or False |
| Net remittances are included when calculating a country’s current account. | True or False |

1. Growth Strategies
   1. What is the Prebish-Singer hypothesis and how does it relate to different kinds of commodities having different income elasticities?
   2. If the hypothesis is proven true, does that support an inward-looking infant industry policy or an outward looking primary commodity-oriented export oriented policy?
   3. Draw a supply and demand graph for a good. The good in question can be supplied by domestic industry or from the international economy. The international supply for this good is perfectly elastic. Contrast the outcome if the economy is closed with the outcome if the economy is open, and the international supply price is lower than the closed economy price.
2. Mashariki workers can produce 6 units of shoes per unit of labor and 10 units of wheat per unit of labor. Neighboring Kusini workers can produce 8 units of shoes and 20 units of wheat per unit of labor.
   1. Write out the production functions for each good in each of the two countries with units of output as a function of units of labor (y=f(L) takes what form for each product in each country).

|  |  |  |
| --- | --- | --- |
|  | Shoes | Wheat |
| Mashariki |  |  |
| Kusini |  |  |

* 1. Identify the product in which each country has a comparative advantage and explain why this is the product in which they have a comparative advantage.
  2. If there are 100 laborers in Kaskazini and 100 in Kusini, describe the level of production of each commodity in each country in autarky if each country divides up their labor force with half of the work force allocated to each commodity.

|  |  |  |
| --- | --- | --- |
|  | Shoes | Wheat |
| Mashariki |  |  |
| Kusini |  |  |
| TOTAL |  |  |

* 1. Illustrate by moving 20 of Mashariki’s workers and 11 of Kusini’s workers to the commodity for which they have comparative advantage how it is possible to increase total production of the two goods without using any new resources.

|  |  |  |
| --- | --- | --- |
|  | Shoes | Wheat |
| Mashariki |  |  |
| Kusini |  |  |
| NEW TOTAL |  |  |

* 1. Illustrate how Mashariki and Kusini can both be better off than they were in autarky if they trade 100 units of shoes for 201 units of wheat.

|  |  |  |
| --- | --- | --- |
|  | Shoes | Wheat |
| Mashariki |  |  |
| Kusini |  |  |
| NEW TOTAL |  |  |

1. There are four workers in the economy who differ in their labor quality as defined by their ‘q’ value. The ‘q’ value is defined on a scale of [0,1] with higher q being higher quality. Worker one has q=1.0, worker two has q=0.9, worker three has q=0.4, and worker four has q=0.3. Production takes place using two workers for each product produced, with output combining workers i and j defined by . There are three ways we can arrange the workers, A, B, and C.

a) Fill in the following

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Arrangement | Pair One | Resulting output 1 | Pair Two | Resulting output 2 | Total output for this arrangement  (1+2) |
| A | (1, 0.9) |  | (0.4, 0.3) |  |  |
| B | (1, 0.4) |  | (0.9, 0.3) |  |  |
| C | (1, 0.3) |  | (0.9, 0.4) |  |  |

Say production can be increased by paying for training that will increase the q of a given worker. The cost of this training, c, can be expressed in terms of output y. Training that costs c raises the skills of a worker as represented by a 0.1 increase in their q value. As you may recall from class, training will be given to the lower q worker in a given pair so you can just focus on that.

1. What is the maximum cost c a firm would be willing to pay for the training that will increase the skill level of the 0.9 worker in a (1, 0.9) pairing as measured by output y?
2. What is the maximum cost c a firm would be willing to pay for the training that will increase the skill level of the 0.3 worker in a (0.4, 0.3) pairing as measured by output y?
3. Contrast your answers to (b) and (c) to illustrate why the O-ring theory can be used to explain a lack of ‘convergence’.
4. Solow model.

In the graph, k is capital per worker on the x-axis, output per worker is defined as on the y-axis with α capturing total factor productivity and β the share of national income controlled by owners of capital, n is population growth rate, δ is the depreciation rate, and s is the savings rate. Draw lines and points on this figure to identify steady states in k and y for:

*1*) the baseline (α,s) as (,

*2*) after growth due to an increased savings rate (α,s’) as (, and

*3*) after growth from an increase in total factor productivity (α’,s) as (.

10) Consider the following set of figures taken from the textbook and answer the questions below.



1. What is the name usually given to this model?
2. What qualitative change in the economy of a country is this model designed to describe?
3. According to this model, where is the profit generated that leads to the increase in the capital stock from KM1 to KM2?