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Self-Test 8 (KEY)

Economic Growth

The tasks in this self-test are designed to be solvable by any student who has mastered the material. The answers provided are written instructionally to walk you through the problem-solving process for each task. A well-prepared student should score between 9 and 11 out of 12 without assistance from AI or others. A 12 out of 12 — without help — requires outlier performance or sheer luck. This self-test is optional, and your result will not count towards your grade. Direct any questions to your section's TA.

1. Country A had a real GDP per capita of $10,000 in 2020 and by 2025 it had grown by $3,000. Country B had a real GDP per capita of $50,000 in 2020 and by 2025 it had grown by $9,000. Which country had a higher average annual growth rate?
   A. **Country A.**
   B. Country B.
   C. Both countries had the same growth rate.
   D. We cannot tell.
   [Country A's growth rate = $3,000 / $10,000 = 30% over 5 years ≈ 6% per year. Country B's growth rate = $9,000 / $50,000 = 18% over 5 years ≈ 3.6% per year. Country A grew faster despite a smaller absolute increase]

2. Which of the following best describes the result of population growth according to Malthusian theory?
   A. It eventually increases living standards to the point of triggering a population decline.
   B. It eventually increases living standards to the point of triggering further population increase.
   C. **It eventually reduces living standards to the point of triggering a population decline.**
   D. It eventually reduces living standards to the point of triggering further population increase.
   [In the Malthusian cycle, population growth puts pressure on fixed resources, reducing GDP per capita until famine, disease, or war brings the population back down. Lower living standards trigger population decline]

3. In 1960, South Korea had a real GDP per capita of $1,200 and grew at an average rate of 7% per year for the next 40 years. Switzerland had a real GDP per capita of $18,000 in 1960 and grew at an average rate of 2% per year over the same period. Which of the following best describes the nature of South Korea's growth in those years?
   A. It was caused by technological innovation at the frontier.
   B. It was initiated by the development of its human capital.
   C. It was driven by its own capital stock.
   D. **It was the result of the exploitation of existing technologies and influx of foreign investment.**
   [No economic history knowledge is required here. Compared to Switzerland, it becomes clear that South Korea was a case of catch-up growth. While all alternative answers contributed to its growth, the primary cause of sustained growth is the exploitation of existing technologies and influx of foreign investment]

4. Which of the following could cause catch-up growth?
    A. A minimum wage law. *[Higher labor costs discourage foreign investors, reducing the capital inflows that drive catch-up growth]*
    B. Tax cuts for foreign investors. *[Lower taxes attract foreign capital and the existing technologies that come with it]*
    C. Incentives for start-ups developing original technologies. *[Developing original technologies drives sustained growth, not catch-up growth]*
    D. Stricter environmental regulations imposed on firms. *[Higher compliance costs discourage foreign investment, reducing the capital inflows needed for catch-up growth]*

5. Which of the following best separates developing countries from so-called "third world" countries?
    A. Developing countries are wealthier. *[Wealth is the outcome of development, not the distinguishing factor]*
    B. Developing countries have more natural resources. *[Unrelated to this distinction. Many third world countries have rich natural resource endowments]*
    C. Developing countries are willing to welcome foreign investment. *[Developing countries have reached the institutional stability threshold that allows foreign investment to flow in, enabling catch-up growth. "Third world" countries remain stuck in poverty traps that deter foreign investors]*
    D. Developing countries strive to develop their own original technologies. *[This describes sustained growth economies]*

6. Which of the following most confidently shows that income inequality is decreasing?
    A. Real GDP per capita PPP is increasing. *[A rising average income says nothing about distribution]*
    B. The average salary is increasing. *[Could be driven entirely by top earners]*
    C. The stock market is increasing. *[A rising stock market primarily benefits asset holders, who tend to be wealthier]*
    D. The percentage of income earned by the bottom half of the population is increasing. *[If the bottom half of the population is capturing a larger share of total income, the distribution is becoming more equal by definition]*
    E. The minimum wage is increasing. *[A rising minimum wage raises the income floor but does not guarantee reduced inequality if top incomes rise even faster]*

7. An economy is currently below its Solow steady state GDP per capita. Its technology does not improve, and its labor force productivity does not develop. Which of the following is expected?
    A. The economy will keep growing towards the steady state.
    B. The economy will remain stagnant.
    C. The economy will shrink.
    D. All of the above are possible.
    [Below the steady state, with constant technology and labor productivity, investment exceeds depreciation. Thus, capital accumulates and output grows, pulling the economy toward the steady state]

8. An economy is currently at its Solow steady-state GDP per capita. Which of the following is accurate?
    A. This economy cannot grow further. *[At the steady state, an economy cannot grow by accumulating more physical capital but it can grow from technological improvement or development of human capital]*
    B. This economy can grow further only through technological advancement and/or human capital development. *[Improvement in technology or development of human capital push the economy to a higher steady state]*
    C. This economy can grow further only through an influx of foreign capital. *[Foreign capital can temporarily boost growth but without technological progress the economy returns to the same steady state]*
    D. This economy can grow further only if its labor force grows. *[Labor force growth increases total GDP but not GDP per capita]*

9. An economy is currently above its Solow steady state GDP per capita. Which of the following is expected?
    A. The economy will keep growing.
    B. The economy will remain stagnant.
    C. The economy will shrink.
    D. All of the above are possible.
    [Above the steady state, depreciation exceeds investment; thus, capital per worker declines, pulling output per capita back down toward the steady state. The economy contracts until it reaches the steady state from above]

10. An economy has s = 0.3, d = 0.2, K = 180, Y = 250. Which of the following is most likely to be its GDP next year?
    A. 0.
    B. 200.
    C. 250.
    D. 300.
    [Investment = s × Y = 0.3 × 250 = 75. Depreciation = d × K = 0.2 × 180 = 36. Since investment exceeds depreciation, capital accumulates and output grows. GDP next year will be higher than 250. Of the options given, only 300 exceeds the current GDP]

11. An economy is currently producing 420 units of real output per capita, which is 20 units more than last year. Its steady state output is 500. Which of the following is most likely to be its growth rate next year?
    A. 0%.
    B. 4%.
    C. 5%.
    D. 6%.
    [This year's growth rate was 20/400 = 5%. As the economy approaches the steady state from below, growth should decelerate. Next year's rate should be slightly below 5%, making 4% the most likely answer]

12. Suppose that an economy's production function exhibits diminishing marginal returns to capital. What is most likely to happen if 10 more units of capital are added?
    A. Total output will increase by more than 10 units.
    B. Total output will increase by exactly 10 units.
    C. **Total output will increase by less than 10 units.**
    D. Total output will not change.
    [Diminishing marginal product means each additional unit of capital adds less output than the previous one but still adds positive output. Adding 10 units of capital increases total output, but by less than 10 units]

Good afternoon! Two types of people will claim they want to help you in life. Those who will lower the bar for you and those who will train you to jump higher. You may love the first type more, but the second will change your life. *Kosmas*

Please report any typos, mistakes, or suggestions for improvement to kmarinakis@smu.edu.sg.