HE2002 Practice Questions
Economic Growth(Ch10-Ch12)

1. Of the following, the most often used measure of changing living standards is
A) the growth rate of nominal GDP.
B) the growth rate of real GDP.
C) the growth rate of nominal GDP per capita.
D) the growth rate of real GDP per capita.
E) unemployment per capita.

2. Over the last hundred years,
A) movements in output due to recessions and recoveries dominate the movement caused by long-run growth.
B) output has decreased in as many years as it has increased.
C) U.S. output has approximately doubled.
D) all of these
E) none of these

3. Suppose individuals wish to obtain the most accurate comparison of living standards between the Canada and Saudi Arabia. To do so, one would convert Saudi Arabian output into dollars using
A) the current nominal exchange rate.
B) the current real exchange rate.
C) the prior year's real exchange rate.
D) an average of the last five years' exchange rates.
E) purchasing power parity methods.

4. If output per capita grows by a constant 6% per year, then the standard of living would grow by about _____ over 3 years.
A) 12%
B) 17%
C) 18%
D) 19%
E) 20%

5. Which of the following is a main conclusion about growth for OECD countries and the four rich countries examined in the chapter?
A) There has been a large increase in the standard of living since 1950.
B) The growth rates have decreased since the mid-1970s.
C) There has been a convergence of output per capita since 1950.
D) all of these
E) none of these

6. Which of the following best characterizes the economic growth for OECD countries since the mid-1970s?
A) Growth has come to a complete halt.
B) Growth has slowed down.
C) Growth has not changed since the 1950s and 1960s.

D) Growth has increased slightly.
E) Growth has increased dramatically.

7. Between 1950 and 2017, standards of living in the OECD countries
A) did not change at all.
B) were converging.
C) all increased at the same rate.
D) decreased at the same rate.
E) decreased, but at different rates.

8. In the OECD countries, there is a negative relationship between output per capita in 1950 and
A) growth since 1950.
B) output per capita in the 1990s.
C) distance from the equator.
D) population.
E) none of these

9. Research by Richard Layard indicates that an increase in a country's level of output per capita will
A) always increase happiness in that country.
B) always decrease happiness in that country.
C) generally have no effect on happiness in that country.
D) increase happiness in that country if output per capita is relatively low.

10. "Convergence" has been occurring among the OECD countries because
A) the richer countries give away more of their output than the poorer ones.
B) the poorer countries have had higher growth rates than the richer ones.
C) the richer countries have had higher growth rates than the poorer ones.
D) the poorer countries have had positive growth rates, while the richer ones have had negative growth rates.
E) the procedures for measuring output per capita have been changing.

11. For this question, assume that there are decreasing returns to capital, decreasing returns to labor, and constant returns to scale. Now suppose that both capital and labor decrease by 5%. Given this information, we know that output (Y) will
A) not change.
B) decrease by less than 5%.
C) decrease by 5%.
D) decrease by more than 5% but less than 10%.
E) none of these

12. For this question, assume that there are decreasing returns to capital, decreasing returns to labor, and constant returns to scale. A reduction in the capital stock will cause which of the following?
A) a reduction in output
B) no change in output
C) an increase in output per capita
D) increase the capital-labor ratio

E) none of these

13. For this question, assume that the production function exhibits the same characteristics as those presented in the textbook. Based on these characteristics (i.e., assumptions), successive and equal increases in capital per worker will cause which of the following to occur?
A) Output per worker will decline.
B) Output per worker will not change.
C) Output per worker will increase by a constant amount.
D) Output per worker will increase by a larger amount.
E) none of these

14. Which of the following will cause a reduction in output per worker in the long run run?
A) capital accumulation or technological progress
B) capital accumulation
C) an increase in the number of workers
D) expansionary monetary policy
E) none of these

15. For this question, assume that a country experiences a permanent increase in its saving rate. Which of the following will occur as a result of this increase in the saving rate?
A) a permanently faster growth rate of output
B) a permanently higher level of output per capita
C) a permanently higher level of capital per worker
D) all of these
E) a permamently higher level of output per capita and capital per worker.

16. For this question, assume that a country experiences a permanent reduction in its saving rate. Which of the following will occur as a result of this reduction in the saving rate?
A) a permanently slower growth rate of output
B) no permanent effect on the level of output per capita
C) a permanently lower level of output per worker
D) a permamently slower growth rate of output but no permanent effect on the level of output per capita

17. Which of the following must occur to sustain economic growth in the long run?
A) technological progress
B) capital accumulation
C) a higher saving rate
D) all of these

18. Given the broadest interpretation of technology, technology will include which of the following?
A) how well firms are run
B) the organization and sophistication of markets
C) the political environment
D) the list of blueprints defining the types of products and the techniques available to produce them
E) all of these

19. Suppose there are two countries that are identical with the following exception. The saving rate in country A is greater than the saving rate in country B. Given this information, we know that in the long run
A) the growth rate of output per capita will be greater in B than in A.
B) the growth rate of output per capita will be greater in A than in B.
C) the capital-labor ratios (K/N) will be the same in both countries.
D) the growth rate of output per capita will be the same in both countries.

20. Suppose there are two countries that are identical with the following exception. The saving rate in country A is greater than the saving rate in country B. Given this information, we know that in the long run
A) the capital-labor ratio (K/N) will be greater in B than in A.
B) the capital-labor ratio (K/N) will be greater in A than in B.
C) the capital-labor ratio (K/N) will be the same in the two countries.
D) economic growth will be higher in A than in B.

21. Suppose there are two countries that are identical with the following exception. The saving rate in country A is greater than the saving rate in country B. Given this information, we know that in the long run
A) output per capita will be greater in B than in A.
B) output per capita will be greater in A than in B.
C) economic growth will be higher in A than in B.
D) more information is needed to answer this question.

22. Which of the following will *not* cause an increase in aggregate output (Y) in the long run?
A) an increase in N
B) an increase in K
C) an increase in technology
D) a reduction in the saving rate
E) none of these

23. Over the past fifty years, convergence has generally occurred for all of the following groups of countries with the exception of
A) the five richest countries.
B) European countries.
C) the "four tigers" in Asia.
D) OECD countries.
E) none of these

24. Assume that constant returns to scale exists and that N and K both increase by 2%. Given this information, we know that
A) output (Y) will increase by 4%.
B) Y will increase by 2%.
C) Y will increase by less than 2%.
D) Y will increase by less than 4% and more than 2%.

25. Assume that constant returns to scale exists and that N and K both decrease by 3%. Given this information, we know that
A) output (Y) will decrease 6%.

B) Y will decrease by 3%.
C) Y will decrease by less than 3%.
D) the capital-labor ratio (K/N) will decrease.

26. Constant returns to scale implies that if N and K both increase by 3% that
A) output (Y) will increase by 3%.
B) Y/N will increase by 3%.
C) Y/N will increase by less than 3%.
D) the capital-labor ratio will increase by 3%.

27. For this question, assume that the saving rate increases. We know that this increase in the saving rate will cause which of the following?
A) a temporary increase in the level of output per capita
B) no permanent change in the level of output per capita
C) a temporary increase in the rate of growth of output per capita
D) a permanently higher rate of growth of output per capita
E) none of these

28. Which of the following will cause a reduction in output per worker (Y/N)?
A) a reduction in the capital stock (K)
B) a reduction in the saving rate
C) a reduction in K/N
D) all of these

29. Assume that employment increases by 3%. Holding all other factors constant, we know with certainty that which of the following will occur?
A) output will increase by 3%
B) output per capita will increase by 3%
C) output will increase by less than 3%
D) the capital labor ratio will increase
E) none of these

30. Suppose the stock of capital increases by 2% and employment increases by 2%. Given this information, we know that
A) output per capita will increase by 6%.
B) output will increase by 4%.
C) output per capita will increase by less than 4% and more than 2%.
D) none of these

31. Decreasing returns to capital (K) implies that a 4% increase in K will cause
A) a reduction in output per worker (Y/N).
B) a reduction in K/N.
C) Y to increase by exactly 4%.
D) Y to increase by less than 4%.
E) no change in Y/N.

32. For this question, assume that the saving rate decreases. We know that this decrease in the saving rate will cause which of the following?
A) a temporary decrease in the level of output per capita
B) no permanent change in the level of output per capita

C) a temporary decrease in the rate of growth of output per capita
D) a permanently lower rate of growth of output per capita
E) none of these

33. Which of the following will cause an increase in output per worker (Y/N)?
A) an increase in the capital stock (K)
B) an increase in the saving rate
C) an increase in K/N
D) all of these

34. Decreasing returns to capital (N) implies that a 4% increase in N will cause
A) Y to increase by more than 4%.
B) Y to increase by exactly 4%.
C) Y to increase by less than 4%.
D) no change in Y/N.

35. Assume that employment decreases by 3%. Holding all other factors constant, we know with certainty that which of the following will occur?
A) output will decrease by 3%
B) output per capita will decrease by 3%
C) output will decrease by less than 3%
D) the capital labor ratio will decrease
E) none of these

36. If output per capita grows by a constant 5% per year, then the standard of living would grow by about _____ over 3 years.
A) 12%
B) 16%
C) 17%
D) 18%
E) 20%

37. An increase in the saving rate will affect which of the following variables in the long run?
A) output per worker
B) capital per worker
C) the level of investment
D) all of these

38. A reduction in the saving rate will *not* affect which of the following variables in the long run?
A) output per worker
B) the growth rate of output per worker
C) the amount of capital in the economy
D) capital per worker
E) none of these

39. Which of the following will cause an increase in output per worker in the long run?
A) an increase in the saving rate
B) a reduction in the depreciation rate
C) an increase in the stock of human capital

D) all of these

40. Which of the following statements is always true?
A) Investment equals depreciation.
B) Investment equals the capital stock minus depreciation.
C) The capital stock is equal to investment minus depreciation.
D) Any change in the capital stock is equal to investment minus depreciation.
E) The increase in investment is equal to the capital stock minus depreciation.

41. The capital-labor ratio will tend to decrease over time when
A) investment per worker equals saving per worker.
B) investment per worker is less than saving per worker.
C) investment per worker exceeds depreciation per worker.
D) saving per worker equals depreciation per worker.
E) output per worker exceeds capital per worker.

42. In the absence of technological progress, which of the following remains constant in the steady state equilibrium?
A) investment per worker
B) output per worker
C) saving per worker
D) all of these
E) investment per worker and output per worker

43. Suppose, due to the effects of a military conflict that has ended, that a country experiences a large reduction in its capital stock. Assume no other effects of this event on the economy. Which of the following will tend to occur as the economy adjusts to this situation?
A) a relatively low growth rate for some time
B) a relative high growth rate for some time
C) zero growth for some time, followed by a gradually increasing growth rate
D) positive growth, followed by negative growth, and then zero growth
E) none of these

44. For this question assume that technological progress does not occur. The rate of saving in Canada has generally been greater than the saving rate in the U.S. Given this information, we know that in the long run
A) Canada's growth rate will be greater than the U.S. growth rate.
B) investment per worker in Canada will be no different than U.S. investment per worker.
C) capital per worker in Canada will be no different than U.S. capital per worker.
D) all of these
E) none of these

45. When an economy is operating at the steady state, we know that
A) steady state saving equals consumption.
B) steady state saving is less than total consumption.
C) steady state saving is equal to depreciation per worker.
D) steady state saving exceeds depreciation each year by a constant amount.
E) none of these

46. In the absence of technological progress, which of the following is true when the

economy is operating at the steady state?
A) The growth of output per worker is zero.
B) The growth of output per worker is equal to the saving rate.
C) The growth of output per worker is equal to the rate of investment.
D) The growth of output per worker is equal to the rate of depreciation.
E) none of these

47. In the absence of technological progress, an increase in the saving rate will cause which of the following?
A) increase temporarily the growth of output per worker
B) increase the steady state growth of output per worker
C) decrease temporarily the growth of output per worker
D) decrease the steady state growth of output per worker
E) have an ambiguous effect on the growth of output per worker

48. In the absence of technological progress, we know with certainty that an increase in the saving rate will cause which of the following?
A) increase steady state consumption
B) decrease steady state consumption
C) have no effect on steady state consumption
D) increase steady state consumption only if the increase in saving exceeds the increase in depreciation
E) increase steady state consumption only if the increase in saving is less than the increase in depreciation

49. In the absence of technological progress, we know that the level of output per worker in the steady state will
A) increase over time.
B) remain constant.
C) decrease as a result of decreasing returns to scale.
D) increase or decrease, depending on the rate of saving.
E) increase or decrease, depending on the rate of depreciation.

50. As an economy adjusts to an increase in the saving rate, we would expect output per worker
A) to increase at a constant rate and continue increasing at that rate in the steady state.
B) to increase at a permanently higher rate.
C) to decrease at a permanently higher rate.
D) to return to its original level.
E) none of these

51. Our model of long-run economic growth suggests that
A) the U.S. growth slowdown since 1950 has been caused largely by low saving in the U.S.
B) a higher rate of saving in the U.S. cannot do much to increase the U.S. growth rate over the next two decades.
C) saving in the U.S. has exceeded the golden-rule level.
D) all of these
E) none of these

52. Suppose there is an increase in the saving rate. This increase in the saving rate must cause

an increase in consumption per capita in the long run when
A) capital per worker approaches the golden-rule level of capital per worker.
B) the saving is used for education rather than physical capital.
C) the rate of saving exceeds the rate of depreciation.
D) there is no technological progress.
E) technological progress depends on human capital.

53. When steady state capital per worker is above the golden-rule level, we know with certainty that an increase in the saving rate will
A) increase consumption in both the short run and the long run.
B) decrease consumption in both the short run and the long run.
C) decrease consumption in the short run, and increase it in the long run.
D) increase consumption in the short run, and decrease it in the long run.
E) none of these

54. Suppose two countries are identical in every way with the following exception. Economy A has a higher saving rate than economy B. Given this information, we know with certainty that
A) steady state consumption in A is higher than in B.
B) steady state consumption in A is lower than in B.
C) steady state consumption in A and in B are equal.
D) steady state growth of output per worker is higher in A than in B.
E) none of these

55. Suppose two countries are identical in every way with the following exception. Economy A has a higher rate of depreciation (δ) than economy B. Given this information, we know with certainty that
A) steady state consumption in A is higher than in B.
B) steady state consumption in A is lower than in B.
C) steady state consumption in A and in B are equal.
D) steady state growth of output per worker is higher in A than in B.
E) none of these

56. Suppose the following situation exists for an economy: $K_{t+1}/N > K_t/N$. Given this information, we know that
A) saving per worker equals depreciation per worker in period t.
B) saving per worker is less than depreciation per worker in period t.
C) saving per worker is greater than depreciation per worker in period t.
D) the saving rate fell in period t.
E) none of these

57. Suppose the following situation exists for an economy: $K_{t+1}/N = K_t/N$. Given this information, we know that
A) saving per worker equals depreciation per worker in period t.
B) saving per worker is less than depreciation per worker in period t.
C) saving per worker is greater than depreciation per worker in period t.
D) the saving rate fell in period t.
E) steady state consumption is equal to the golden rule level of steady state consumption.

58. At the current steady state capital-labor ratio, assume that the steady state level of per

capita consumption, $(C/N)^*$, is <u>less</u> than the golden rule level of steady state per capita consumption. Given this information, we can be certain that
A) an increase in the saving rate will cause an increase in the steady state level of per capita consumption $((C/N)^*)$.
B) a reduction in the capital-labor ratio will cause a reduction in $(C/N)^*$.
C) the capital labor ratio will tend to increase over time.
D) the capital labor ratio will tend to decrease over time.
E) a reduction in the saving rate will have an ambiguous effect on $(C/N)^*$.

59. Suppose the following situation exists for an economy: $K_{t+1}/N < K_t/N$. Given this information, we know that
A) saving per worker equals depreciation per worker in period t.
B) consumption per worker will tend to fall as the economy adjusts to this situation.
C) saving per worker is greater than depreciation per worker in period t.
D) the saving rate increased in period t.
E) none of these

60. The golden rule level of capital refers to
A) the level of capital that maximizes output per worker.
B) the level of capital that maximizes the standard of living.
C) the level of capital that maximizes consumption per worker in the steady state.
D) all of these
E) none of these

61. Suppose the following situation exists for an economy: $K_{t+1}/N = K_t/N$. Given this information, we know with certainty that
A) the economy is operating at the golden rule equilibrium in period t.
B) saving per worker is less than depreciation per worker in period t.
C) saving per worker is greater than depreciation per worker in period t.
D) investment per worker equals depreciation per worker in period t.

62. Suppose the saving rate is initially less than the golden rule saving rate. We know with certainty that a reduction in the saving rate will cause
A) a reduction in the capital labor ratio.
B) a reduction in output per worker.
C) a reduction in consumption per worker.
D) all of these
E) none of these

63. Suppose the saving rate is initially greater than the golden rule saving rate. We know with certainty that a reduction in the saving rate will cause
A) a reduction in the rate of growth in the long run.
B) a reduction in output per worker.
C) a reduction in consumption per worker.
D) all of these
E) none of these

64. Which of the following represents the change in the capital stock?
A) consumption minus depreciation

B) output minus depreciation
C) investment minus saving
D) investment minus depreciation

65. When the economy is in the steady state, we know with certainty that
A) investment per worker is equal to depreciation per worker.
B) consumption per worker is maximized.
C) output per worker is maximized.
D) the growth rate is maximized.
E) all of these

66. Which of the following represents the effects in period t of an increase in the saving rate in period t?
A) no change in K/N
B) no change in Y/N
C) a reduction in C/N
D) all of these

67. Suppose there are two countries that are identical in every way with the following exception: Country A has a lower depreciation rate (δ) than country B. Given this information, we know with certainty that
A) the growth rate will be the same in the two countries.
B) the growth rate will be higher in A than in B.
C) K/N will be higher in B.
D) Y/N will be higher in B.

68. Suppose the economy is initially in the steady state. An increase in the depreciation rate (δ) will cause
A) a reduction in K/N.
B) a reduction in Y/N.
C) a reduction in C/N.
D) all of these
E) none of these

69. Suppose the economy is initially in the steady state. A reduction in the depreciation rate (δ) will cause
A) an increase in K/N.
B) an increase in the growth rate in the long run.
C) a reduction in C/N.
D) all of these

70. Which of the following will likely cause an increase in output per worker?
A) an increase in education expenditures
B) an increase in the saving rate
C) an increase in on-the-job training
D) all of these

71. Based on our understanding of the model presented in chapter 11, which of the following will cause a permanent increase in growth?
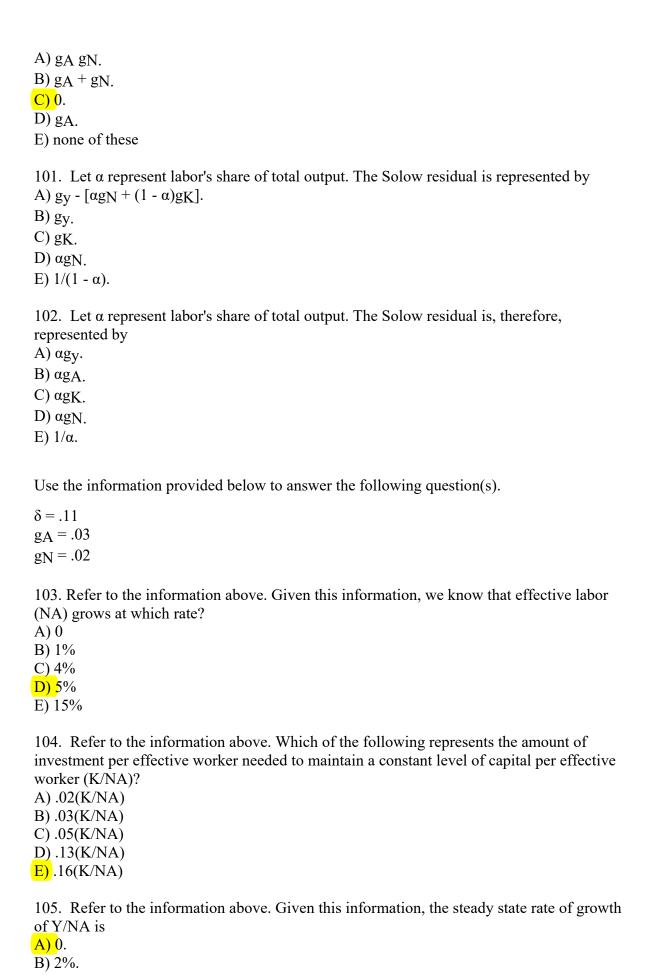A) an increase in education spending

B) an increase in the saving rate
C) an increase in capital accumulation
D) all of these
E) none of these
72. An increase in the saving rate will *not* affect which of the following variables in the long run?
A) output per worker
B) the growth rate of output per worker
C) the amount of capital in the economy
D) capital per worker
E) none of these

73. The capital-labor ratio will tend to increase over time when
A) investment per worker equals saving per worker.
B) investment per worker exceeds saving per worker.
C) investment per worker is less than depreciation per worker.
D) saving per worker equals depreciation per worker.
E) output per worker is less than capital per worker.

74. In the absence of technological progress, a decrease in the saving rate will cause which of the following?
A) decrease temporarily the growth of output per worker
B) decrease the steady state growth of output per worker
C) increase temporarily the growth of output per worker
D) increase the steady state growth of output per worker
E) have an ambiguous effect on the growth of output per worker

75. In the following production function, Y = f(K, NA), a 20% increase in A will cause which of the following variables to increase by 20%?
A) labor
B) effective labor
C) output
D) output per worker
E) none of these

76. In the following production function, Y = f(K, NA), suppose A increases by 20%. This 20% increase in A implies that
A) the same output can be produced with 20% less labor.
B) the effective quantity of labor has increased by 20%.
C) output will increase by less than 20%.
D) all of these

77. In the production function Y = f(K, NA), for a given state of technology, constant returns to scale implies that output (Y) will increase by 7% when
A) K or NA increase by 7%.
B) K and N increase by 7%.
C) N or A increase by 7%.
D) N and A increase by 7%.
E) all of these

78. Which of the following will cause an increase in output per *effective* worker?
A) an increase in population growth
B) an increase in the rate of depreciation
C) a reduction in the saving rate
D) an increase in the rate of technological progress
E) an increase in the saving rate

Use the following information to answer the question(s) below:

(1) the rate of depreciation is 10% per year,
(2) the population growth rate is 2% per year, and
(3) the growth rate of technology is 3% per year.

79. Refer to the information above. Which of the following equals the annual growth rate of "effective labor" in the steady state in this economy?
A) 2%
B) 3%
C) 5%
D) 10%
E) 15%

80. Refer to the information above. Which of the following represents the level of investment needed to maintain a constant capital stock (K) in this economy?
A) .02K
B) .03K
C) .05K
D) .10K
E) .15K

81. Refer to the information above. Which of the following represents the level of investment needed to maintain constant capital per effective worker (K/NA) in this economy?
A) .02K
B) .03K
C) .05K
D) .10K
E) .15K

82. Refer to the information above. Which of the following represents the steady-state growth rate of output in this economy?
A) 2%
B) 3%
C) 5%
D) 10%
E) 15%

83. Refer to the information above. Which of the following represents the steady-state growth rate of output per worker in this economy?
A) 2%
B) 3%
C) 5%
D) 10%
E) 15%

84. Which of the following will cause an increase in the steady-state growth rate of capital?
A) an increase in the saving rate
B) an increase in the population growth rate
C) a temporary increase in technological progress
D) all of these
E) none of these

85. Which of the following will cause a reduction in the steady-state growth rate of output per worker?
A) a reduction in the saving rate
B) an increase in the population growth rate
C) an increase in the rate of depreciation
D) an increase in the saving rate
E) none of these

86. Which of the following is always true after an economy reaches a balanced growth equilibrium?
A) the growth rate of output equals the rate of depreciation
B) population growth is zero
C) the growth rate of capital is equal to the growth rate of the effective work force
D) the growth rate of capital is equal to the savings rate
E) none of these

87. Suppose there is an increase in the saving rate. This increase in the saving rate will cause an increase in which of the following once the economy reaches its new steady state equilibrium?

A) growth rate of output
B) growth rate of capital
C) growth rate of capital per worker
D) all of these
E) none of these

88. Suppose output per worker in a country has grown at the same rate as technology over for many years. This country's growth would be described as
A) "appropriable" growth.
B) "balanced" growth.
C) "effective" growth.
D) "diffuse" growth.
E) none of these

89. Which of the following represents a dimension of technological progress?

A) larger quantities of output for given quantities of capital and labor
B) better products
C) a larger variety of products
D) new products
E) all of these

90. Assume that an economy experiences both positive population growth and technological progress. In this economy, which of the following is constant when balanced growth is achieved?
A) K
B) NA
C) K/N
D) Y/NA
E) none of these

91. Assume that an economy experiences both positive population growth and technological progress. In this economy, which of the following is constant when balanced growth is achieved?

A) I
B) S
C) Y/N
D) all of these
E) none of these

92. Which of the following is *not* constant when balanced growth is obtained?
A) Y/NA
B) NA
C) K/NA
D) all of these
E) none of these

93. Assume that an economy experiences both positive population growth and technological progress. Once the economy has achieved balanced growth, we know that the capital stock is
A) constant.
B) growing at a rate of g_A.
C) growing at a rate of g_N.
D) growing at a rate of $g_A + g_N$.
E) none of these

94. Assume that an economy experiences both positive population growth and technological progress. Once the economy has achieved balanced growth, we know that output (Y) is
A) constant.
B) growing at a rate of $g_A + g_N$.
C) growing at a rate of g_N.
D) growing at a rate of g_A.
E) growing at a rate of $g_A - g_N$.

95. Assume that an economy experiences both positive population growth and technological progress. Once the economy has achieved balanced growth, we know that the capital per effective worker ratio (K/NA) is
A) growing at a rate of $\delta + g_A + g_N$.
B) growing at a rate of $g_A + g_N$.
C) growing at a rate of g_N.
D) growing at a rate of g_A.
E) none of these

96. Assume that an economy experiences both positive population growth and technological progress. Once the economy has achieved balanced growth, we know that the output per effective worker ratio (Y/NA) is
A) growing at a rate of 0.
B) growing at a rate of $g_A + g_N$.
C) growing at a rate of g_N.
D) growing at a rate of g_A.
E) none of these

97. Assume that an economy experiences both positive population growth and technological progress. Once the economy has achieved balanced growth, we know that the output per worker ratio (K/N) is
A) constant.
B) growing at a rate of g_A - g_N.
C) growing at a rate of g_N.
D) growing at a rate of g_A.
E) growing at a rate of $\delta + g_A + g_N$.

98. Assume that an economy experiences both positive population growth and technological progress. Once the economy has achieved balanced growth, we know that the capital per worker ratio (K/N) is
A) constant.
B) growing at a rate of g_A - g_N.
C) growing at a rate of g_N.
D) growing at a rate of g_A.
E) growing at the same rate as Y/N.

99. Assume that an economy experiences both positive population growth and technological progress. Once the economy has achieved balanced growth, we know that

A) S/NA = $(\delta + g_A + g_N)$K/NA.
B) S/NA = $(g_A + g_N)$K/NA.
C) I/NA = (δ)K/NA.
D) I = δK.
E) none of these

100. Assume that an economy experiences both positive population growth and technological progress. Once the economy has achieved balanced growth, we know that growth rate of K/NA is

A) g_A g_N.
B) $g_A + g_N$.
C) 0.
D) g_A.
E) none of these

101. Let α represent labor's share of total output. The Solow residual is represented by
A) $g_y - [\alpha g_N + (1 - \alpha)g_K]$.
B) g_y.
C) g_K.
D) αg_N.
E) $1/(1 - \alpha)$.

102. Let α represent labor's share of total output. The Solow residual is, therefore, represented by
A) αg_y.
B) αg_A.
C) αg_K.
D) αg_N.
E) $1/\alpha$.

Use the information provided below to answer the following question(s).

$\delta = .11$
$g_A = .03$
$g_N = .02$

103. Refer to the information above. Given this information, we know that effective labor (NA) grows at which rate?
A) 0
B) 1%
C) 4%
D) 5%
E) 15%

104. Refer to the information above. Which of the following represents the amount of investment per effective worker needed to maintain a constant level of capital per effective worker (K/NA)?
A) .02(K/NA)
B) .03(K/NA)
C) .05(K/NA)
D) .13(K/NA)
E) .16(K/NA)

105. Refer to the information above. Given this information, the steady state rate of growth of Y/NA is
A) 0.
B) 2%.

C) 3%.
D) 5%.
E) 16%.

106. Refer to the information above. Given this information, the steady state rate of growth of output per worker is
A) 0.
B) 2%.
C) 3%.
D) 5%.
E) 16%.

107. Refer to the information above. Given this information, the steady state rate of growth of output is

A) 0.
B) 2%.
C) 3%.
D) 5%.
E) 16%.

108. Assume that an economy experiences both positive population growth and technological progress. A reduction in the saving rate will cause
A) no change in K/NA.
B) a permanent reduction in the rate of growth of output per worker.
C) a permanent reduction in the rate of growth of output.
D) no change in Y/NA.
E) none of these

109. Which of the following will cause an increase in the steady-state growth rate of output per worker?
A) an increase in the saving rate
B) a reduction in the population growth rate
C) a reduction in the rate of depreciation
D) a reduction in the saving rate
E) none of these

110. Suppose there is a reduction in the saving rate. This decrease in the saving rate will cause a reduction in which of the following once the economy reaches its new steady state equilibrium?
A) growth rate of output
B) growth rate of capital
C) growth rate of capital per worker
D) all of these
E) none of these