Fall 2020
Final examination. The exam has 53 multiple choice questions. Good luck!

1) Which of the following indicates total dollar income of U.S. residents?
a) Real GDP
b) Nominal GDP
c) Real GNP
d) Nominal GNP
e) None of the above

2) Which of the following indicates total dollar value-added of enterprises located in the U.S.?
a) Real GDP
b) Nominal GDP
c) Real GNP
d) Nominal GNP
e) None of the above

3) Here is some information about a factory that makes shoes. What is value added for this factory?

Revenue from sales of shoes	$10
Wages and salaries of employees	$5
Cost of leather	$1
Cost of fuel to run the factory	$2
Rent paid to factory building owner	$2

Value added is
a) $0
b) $1
c) $2
d) $3
e) None of the above

4) What's bigger, nominal GDP or nominal GNP?
a) GDP is bigger
b) GNP is bigger
c) They must be equal
d) Either one can be bigger - it depends.
e) They are measured in different units, so they can't be compared.

5) Suppose an economy has this aggregate production function: $Y = 10 + 6K^{1/3}L^{2/3} + 2L$
What is the marginal product of labor in the economy? Hint: take the derivative!
a) $4K^{1/3}L^{-1/3} + 2$
b) $4K^{1/3}L^{-1/3}$
c) $2K^{-1/3}L^{-2/3}$
d) $10 + 4K^{1/3}L^{-2/3} + 2$
e) None of the above

6) Suppose an economy has this aggregate production function: $Y = 10 + 6K^{1/3}L^{2/3} + 2L$

What is the marginal product of capital in the economy? Hint: take the derivative!

a) $4K^{1/3}L^{-1/3} + 2$

b) $4K^{1/3}L^{-1/3}$

c) $2K^{-2/3}L^{2/3}$

d) $10 + 4K^{1/3}L^{-2/3} + 2$

e) None of the above

7) When a country breaks up into two countries, total real GDP of the two countries is usually about the same as the real GDP of the original country before the break-up. This shows aggregate production functions have which property?

a) Cobb-Douglas form

b) Euler's theorem

c) Diminishing marginal product

d) Constant returns to scale

e) None of the above

8) Here is an exercise in "growth accounting." Given the information below, what was the average percent rate of growth of Total Factor Productivity (A) in the economy? Hint: do the math!

Share of national income going to owners of capital: 1/3

Average annual growth in real GDP: 8 %

Average annual growth in capital stock   9%

Average annual growth in labor input   6%

a) 0 %

b) 1%

c) 2%

d) 3%

e) None of the above

9) The Solow model of economic growth implies that the savings rate in an economy can be too high. In an economy with a too-high savings rate, which of the following things are true in the long-run steady state (long-run equilibrium)?

I   The marginal product of capital is too high

II   The marginal product of capital is too low

III Output per person is too high

IV Output per person is too low

a) I & III

b) I & IV

c) II&III

d) II & IV

e) II only

10) Consider the immediate effect on consumption per person c of an increase in the savings rate s in the Solow model, versus the effect that will prevail in the very long run. Which of the following is true?

a) May or may not reduce c immediately; may or may not reduce c in long run

b) Increases c immediately and in the very long run

c) Decreases c immediately and in the very long run

d) May or may not decrease c immediately, increases c in the very long run

e) none of the above

11) Think about the graph we use to describe the Solow model of economic growth. Why is the *f(k)* line "concave" (bowed down) rather than straight or "convex" (bowed up)? Because of:
a) constant returns to scale
b) diminishing marginal product of capital
c) diminishing marginal product of labor
d) a constant savings rate
e) none of the above

12) The term "efficiency wages" refers to the possibility that there is real-wage rigidity and structural unemployment because:
a) minimum wage laws prevent employers from cutting wages
b) union bargaining power prevents firms from cutting wages
c) employers increase profit by paying higher wages
d) all of the above
e) none of the above

13) Think about a closed economy with an expectations-augmented Phillips curve and an IS curve.
Assume the economy's natural rate of interest is 3 percent and its natural rate of unemployment (or NAIRU) is 6 percent.
Suppose expected inflation is 2 percent, and realized inflation this year is 1 percent. What do you know about the unemployment rate this year?
a) It must be equal to 6 percent.
b) It must be less than 6 percent.
c) It must be greater than 6 percent.
d) That information does not imply anything about the unemployment rate.
e) None of the above.

14) Think about a closed economy with an expectations-augmented Phillips curve and an IS curve. Assume the economy's natural rate of interest is 3 percent and its natural rate of unemployment (or NAIRU) is 6 percent.
Suppose expected inflation is 2 percent, and realized inflation this year is 3 percent. What do you know about real GDP this year?
a) It is equal to potential GDP (the natural rate of output)
b) It is greater than potential GDP (the natural rate of output)
c) It is less than potential GDP (the natural rate of output)
d) That information does not imply anything about real GDP
e) None of the above.

15) Think about a closed economy with an expectations-augmented Phillips curve and an IS curve. Assume the economy's natural rate of interest is 3 percent and its natural rate of unemployment (or NAIRU) is 6 percent.
Suppose expected inflation is 2 percent, and realized inflation this year is 3 percent. What do you know about the real interest rate this year?
a) It is equal to 3 percent
b) It is greater than 3 percent
c) It is less than 3 percent
d) That information does not imply anything about the real interest rate.
e) None of the above.

16) Consider a closed economy in which output is always equal to the natural rate of output ($Y = \bar{Y}$). What will happen to investment and the real interest rate in the economy in response to a decrease in government purchases of goods and services? Hint: draw a loanable funds graph and use the equation for *S*.
a) *I* up, *r* up.
b) *I* up, *r* down.
c) *I* down, *r* up.
d) *I* down, *r* down.
e) None of the above.

17) Consider a closed economy in which output is always equal to the natural rate of output ($Y = \bar{Y}$). What will happen to investment and the real interest rate in the economy in response to a decrease in transfers? Hint: draw a loanable funds graph and use the equation for S.
a) I up, r up.
b) I up, r down.
c) I down, r up.
d) I down, r down.
e) None of the above.

18) Consider a closed economy in which output is always equal to the natural rate of output ($Y = \bar{Y}$). What will happen to investment and the real interest rate in the economy in response to a decrease in the parameter a in the consumption function $Y = a + b(Y - T)$? Hint: draw a loanable funds graph and use the equation for S.
a) I up, r up.
b) I up, r down.
c) I down, r up.
d) I down, r down.
e) None of the above.

19) Consider a closed economy in which output is always equal to the natural rate of output ($Y = \bar{Y}$). What will happen to investment and the real interest rate in the economy in response to a decrease in the parameter c in the investment function $I = c - dr$? Hint: draw a loanable funds graph and use the equation for S.
a) I up, r up.
b) I up, r down.
c) I down, r up.
d) I down, r down.
e) None of the above.

20) Consider a closed economy where the central bank fixes the money supply and the price level remains fixed too. Which of the following events tend to increase the rate of interest r in the economy?
I) The government increases spending on construction of new roads and bridges
II) The government increases Social Security payments
III) The central bank increases the money supply
IV) The central bank decreases the money supply

a) I only
b) II only
c) I and II
d) I, II and III
e) I, II and IV

21) Which of the following production functions does *not* have constant returns to scale?
a) $Y = 2K + 3L$
b) $Y = 20 + 2K + 3L$
c) $Y = K^{1/2}L^{1/2}$
d) $Y = K^{1/3}L^{2/3}$
e) They all have constant returns to scale.

22) Consider an economy described by the Solow growth model with a savings rate s, a depreciation rate δ and a rate of population growth n. Which of the following events changes long-run steady state output per worker $y*$?
I) An increase in n
II) An increase in δ
III) An increase in s
IV) An event that suddenly destroys capital, such as fire or flood

a) I, II, III, IV
b) I, II, III only
c) I, II only
d) III and IV only
e) IV only

23) Consider an economy described by the Solow growth model with a savings rate s, a depreciation rate δ and a rate of population growth n. Which of the events changes output per worker in the Golden Rule state y^*_{gold} ?

I) An increase in n
II) An increase in δ
III) An increase in s
IV) An event that suddenly destroys capital, such as fire or flood

a) I, II, III, IV
b) I, II, III only
c) I, II only
d) III and IV only
e) IV only

24) Consider an economy described by the Solow growth model with a savings rate s, a depreciation rate δ and a rate of population growth n. Which of the events changes output per worker y in the short run but NOT in the long run steady state?
I) An increase in n
II) An increase in δ
III) An increase in s
IV) An event that suddenly destroys capital, such as fire or flood

a) I, II, III, IV
b) I, II, III only
c) I, II only
d) III and IV only
e) IV only

25) Consider a closed economy where the central bank fixes the money supply and the price level is fixed. Which of the following events tend to increase the natural rate of interest $\bar{r}$?
I) The government increases spending on construction of new roads and bridges
II) The government increases Social Security payments
III) The central bank increases the money supply
IV) The central bank decreases the money supply

a) I only
b) II only
c) I and II
d) I, II) and III
e) I, II and IV

26) Consider two closed economies, A and B. In both economies, the central bank fixes the money supply. In economy A, the marginal propensity to consume is 0.7. In B, it is 0.9. Otherwise the two economies are identical. Which of the following statements is likely to be correct?
a) IS curve flatter in A
b) IS curve flatter in B
c) IS curve has the same slope in A and B
d) LM curve flatter in A
e) LM curve flatter in B

27) Consider two economies, A and B. In both, the central bank fixes the money supply. In A, a change in real income has a big effect on the quantity demanded of real money balances. In B, a change in real income has a small effect on the quantity demanded of real money balances. Which of the following statements is likely to be correct?
a) IS curve flatter in A
b) IS curve flatter in B
c) LM curve flatter in A
d) LM curve flatter in B
e) None of the above

28) Consider two economies, A and B. In both, the central bank fixes the money supply. In A, a change in the nominal interest rate has a big effect on the quantity demanded of real money balances. In B, a change in the nominal interest rate has a small effect on the quantity demanded of real money balances. Which of the following statements is likely to be correct?
a) IS curve flatter in A
b) IS curve flatter in B
c) LM curve flatter in A
d) LM curve flatter in B
e) None of the above

29) Consider an economy is characterized by an expectations-augmented Phillips curve: $\pi = E\pi + \frac{1}{\alpha}(Y - \bar{Y})$. What is the equation of the aggregate supply curve in this economy, that is the equation which is plotted on the graph along with the AD curve? Hint: do the algebra!
a) $Y = \bar{Y} + \alpha(p - Ep)$
b) $Y = \bar{Y} + \alpha(\pi - E\pi)$
c) $p = Ep + \frac{1}{\alpha}(Y - \bar{Y})$
d) $p = Ep + \alpha(Y - \bar{Y})$
e) None of the above

30) Consider an economy is characterized by an expectations-augmented Phillips curve: $\pi = E\pi + \frac{1}{\alpha}(Y - \bar{Y})$. Under which of the following circumstances will this year's realized inflation π turn out to be *higher* than expected?
a) Output is equal to the natural rate of output.
b) The real interest rate r is higher than the natural rate of interest $\bar{r}$.
c) The real interest rate r is lower than the natural rate of interest $\bar{r}$.
d) The real interest rate r is equal to the natural rate of interest $\bar{r}$.
e) None of the above

31) Consider an economy is characterized by an expectations-augmented Phillips curve: $\pi = E\pi + \frac{1}{\alpha}(Y - \bar{Y})$. Suppose expectations are "adaptive" and last year's rate of inflation was *four* percent. Under which of the following circumstances might this year's realized inflation π turn out to be equal to *five* percent?
a) Output is equal to the natural rate of output.
b) The real interest rate r is higher than the natural rate of interest $\bar{r}$.
c) The real interest rate r is lower than the natural rate of interest $\bar{r}$.
d) The real interest rate r is equal to the natural rate of interest $\bar{r}$.
e) None of the above

32) Consider a closed economy where, for many years, the central bank has been increasing the money supply by 4 percent a year and inflation has been about 4 percent. Then the central bank *increases* the rate of growth of the money supply from 4 percent to 10 percent, *after* publicly announcing that it will do so. What is the likely result if everyone in the economy took Economics 362 but skipped class, did not do the problem sets and is a bit dim?
a) In the short run inflation is greater than 10 percent and there is a recession. In the long run there is neither recession nor boom and the inflation rate is 10 percent.
b) In the short run there is a boom; inflation is greater than 4 percent but less than 10 percent. In the long run there is neither recession nor boom and the inflation rate is 10 percent.
c) In both the short run and the long run inflation is 10 percent and there is neither recession nor boom.
d) In the short run inflation is a bit below 4 percent and there is a recession; in the long run inflation is 10 percent and there is neither recession nor boom.
e) None of the above

33) Consider a closed economy where, for many years, the central bank has been increasing the money supply by 4 percent a year and inflation has been about 4 percent. Then the central bank *increases* the rate of growth of the money supply from 4 percent to 10 percent, *after* publicly announcing that it will do so. What is the likely result if everyone in the economy took Economics 362, paid attention, did the problem sets and is smart?
a) In the short run inflation is greater than 10 percent and there is a recession. In the long run there is neither recession nor boom and the inflation rate is 10 percent.
b) In the short run there is a boom; inflation is greater than 4 percent but less than 10 percent. In the long run there is neither recession nor boom and the inflation rate is 10 percent.
c) In both the short run and the long run inflation is 10 percent and there is neither recession nor boom.
d) In the short run inflation is a bit below 4 percent and there is a recession; in the long run inflation is 10 percent and there is neither recession nor boom.
e) None of the above

34) Consider a small open economy in the long run ($Y = \bar{Y}$). Suppose there is an increase in the world real interest rate r^*. What happens to the economy's net capital outflow (NCO), net exports (NX) and real exchange rate? Hint: draw two graphs. One is a loanable funds graph. The other has the real exchange rate on the vertical axis. Start from a situation of "balanced trade."
a) NCO increases, NX increases, real exchange rate depreciates (ε decreases)
b) NCO increases, NX decreases, real exchange rate appreciates (ε increases)
c) NCO decreases, NX increases, real exchange rate depreciates (ε decreases).
d) NCO decreases, NX decreases, real exchange rate appreciates (ε increases).
e) No change in NCO or NX but real exchange rate appreciates (ε increases).

35) Consider a small open economy in the long run ($Y = \bar{Y}$). Suppose that demand for the economy's exports increases, so the value of exports would be larger at any given real exchange rate. What happens to the economy's net capital outflow (NCO), net exports (NX) and real exchange rate? Hint: draw two graphs. One is a loanable funds graph. The other has the real exchange rate on the vertical axis. Start from a situation of "balanced trade."
a) NCO increases, NX increases, real exchange rate depreciates (ε decreases)
b) NCO increases, NX decreases, real exchange rate appreciates (ε increases)
c) NCO decreases, NX increases, real exchange rate depreciates (ε decreases).
d) NCO decreases, NX decreases, real exchange rate appreciates (ε increases).
e) No change in NCO or NX but real exchange rate appreciates (ε increases).

36) Consider a small open economy in the long run ($Y = \bar{Y}$). Suppose there is a reduction in investment opportunities in the economy, so that investment spending is lower at any given real interest rate.
What happens to the economy's net capital outflow (NCO), net exports (NX) and real exchange rate in response to the following events, assuming everything else remains fixed? Hint: draw two graphs. One is a loanable funds graph. The other has the real exchange rate on the vertical axis. Start from a situation of "balanced trade."
a) NCO increases, NX increases, real exchange rate depreciates (ε decreases)
b) NCO increases, NX decreases, real exchange rate appreciates (ε increases)
c) NCO decreases, NX increases, real exchange rate depreciates (ε decreases).
d) NCO decreases, NX decreases, real exchange rate appreciates (ε increases).
e) No change in NCO or NX but real exchange rate appreciates (ε increases).

37) Consider a small open economy in the long run ($Y = \bar{Y}$). Suppose there is an increase in government purchases in the economy, with no change in taxes net of transfers. What happens to the economy's net capital outflow (NCO), net exports (NX) and real exchange rate? Hint: draw two graphs. One is a loanable funds graph. The other has the real exchange rate on the vertical axis. Start from a situation of "balanced trade."
a) NCO increases, NX increases, real exchange rate depreciates (ε decreases)
b) NCO increases, NX decreases, real exchange rate appreciates (ε increases)
c) NCO decreases, NX increases, real exchange rate depreciates (ε decreases).
d) NCO decreases, NX decreases, real exchange rate appreciates (ε increases).
e) No change in NCO or NX but real exchange rate appreciates (ε increases).

38) Which of those people would not be counted as unemployed in our national statistics, but is unemployed on the economist's definition?
a) Harry does not have a job. He is a full-time college student.
b) Melissa owns and manages a Burger King franchise.
c) Aloysius is a recent high-school graduate who does not have a job. He applies for many jobs and goes on many job interviews. He will take a job that pays $100,000 a year, but not a job that pays less than that.
d) Cecilia was an autoworker until the plant shut down. She has not applied for any jobs or had any interviews recently because no employer within commuting distance of her town is hiring. She will take the first job she is offered, at any wage.
e) Harrison is a recent college graduate who does not have a job. He spends all of his time in his mother's basement watching "Rick and Morty" and huffing aerosols.

39) Which of the following would *not* be included in the construction of a CPI for the United States?
a) Prices of U.S.-produced automobiles
b) Prices of U.S. medical services
c) Tuition rates charged by New York state universities
d) Prices of televisions produced in the country of Taiwan, sold in the U.S.
e) All of the above would be included in the price index

40) Which of the following would *not* be included in the construction of a GDP price index for the United States?
a) Prices of U.S.-produced automobiles
b) Prices of U.S. medical services
c) Tuition rates charged by New York state universities
d) Prices of televisions produced in the country of Taiwan, sold in the U.S.
e) All of the above would be included in the price index

41) Look at the following data on prices and quantities in an economy.

| | Peanut butter | | | Jelly | |
Year	Quantity	Price		Quantity	Price
2002	5	10		100	1
2003	4	11		110	2

Which of the lines below gives you the formula for a *Laspeyres* price index for 2003, base year 2002?

a) $[(4\times11)+(110\times2)] / [(4\times10)+(110\times1)]$

b) $[(5\times11)+(100\times2)] / [5\times10)+(100\times1)]$

c) $[(4\times11)+(110\times2)] / [(5\times10)+(100\times1)]$

d) $\sqrt{\left([(4\times11)+(110\times2)] / [(4\times10)+(110\times1)] \right)\times\left([(4\times11)+(110\times2)] / [(5\times10)+(100\times1)] \right)}$

e) None of the above

42) Look at the following data on prices and quantities in an economy.

| | Peanut butter | | | Jelly | |
Year	Quantity	Price		Quantity	Price
2002	5	10		100	1
2003	4	11		110	2

Which of the lines below gives you the formula for a *Paasche* price index for 2003, base year 2002?

a) $[(4\times11)+(110\times2)] / [(4\times10)+(110\times1)]$

b) $[(5\times11)+(100\times2)] / [5\times10)+(100\times1)]$

c) $[(4\times11)+(110\times2)] / [(5\times10)+(100\times1)]$

d) $\sqrt{\left([(4\times11)+(110\times2)] / [(4\times10)+(110\times1)] \right)\times\left([(4\times11)+(110\times2)] / [(5\times10)+(100\times1)] \right)}$

e) None of the above

43) Assuming that the "Solow model of economic growth" is true for all countries, which of the following countries is likely to have the highest output per worker in the long run?

	Savings rate	Depreciation rate	Population growth rate
Country A	15%	10%	3%
Country B	10%	10%	5%
Country C	5%	10%	3%
Country D	5%	12%	3%
Country E	10%	12%	3%

a) Country A.
b) Country B.
c) Country C.
d) Country D.
e) Country E.

44) What are the three functions of money? Pick them out from the following list, write down the Roman numerals, then choose your answer below.
I) Real interest rate
II) Store of value
III) Unit of account
IV) Nominal interest rate
V) Reserve requirement
VI) Sacrifice ratio
VII) Medium of exchange

a) I, II, III
b) II, III, IV
c) II, IV, VI
d) II, IV, VI
e) None of the above

45) What are the two less-important functions of money - functions that are usually, but not always performed by the money of a country? Pick them out from the following list, write down the Roman numerals, then choose your answer below.
I) Real interest rate
II) Store of value
III) Unit of account
IV) Nominal interest rate
V) Reserve requirement
VI) Sacrifice ratio
VII) Medium of exchange

a) I, II
b) II, III
c) III, IV
d) IV, V
e) V, VI

46) What is the opportunity cost of holding money? Pick them out from the following list, write down the Roman numerals, then choose your answer below.
I) Real interest rate
II) Store of value
III) Unit of account
IV) Nominal interest rate
V) Reserve requirement
VI) Sacrifice ratio
VII) Medium of exchange

a) I)
b) II)
c) III)
d) IV
e) None of the above

47) In our model of a closed economy, which of the following events can increase the "natural rate of interest"?
a) A decrease in the price level
b) A decrease in the money supply M^S
c) An increase in expected future inflation π^e
d) A decrease in government purchases of goods and services G
e) A decrease in taxes net of transfers T

48) Consider a country that can be described by the IS/LM model, in which the central bank chooses a value for the money supply and the price level is fixed. What happens to output Y and the real interest rate r in response to an increase in government purchases of goods and services? Hint: draw a graph!
 a) Y up, r down.
b) Y up, r up.
c) Y down, r down.
d) Y down, r up.
e None of the above.

49) Consider a country that can be described by the IS/LM model, in which the central bank chooses a value for the money supply and the price level is fixed. What happens to output Y and the real interest rate r in response to an increase in expected future inflation $E\pi$? Hint: draw a graph!
a) Y up, r down.
b) Y up, r up.
c) Y down, r down.
d) Y down, r up.
e None of the above.

50) Consider a country that can be described by the IS/LM model, in which the central bank chooses a value for the money supply and the price level is fixed. What happens to output Y and the real interest rate r in response to an increase in taxes?
 Hint: draw a graph!
a) Y up, r down.
b) Y up, r up.
c) Y down, r down.
d) Y down, r up.
e None of the above.

51) Consider a country that can be described by the IS/LM model, in which the central bank chooses a value for the money supply and the price level is fixed. What happens to output Y and the real interest rate r in response to an increase in transfers? Hint: draw a graph!
a) Y up, r down.
b) Y up, r up.
c) Y down, r down.
d) Y down, r up.
e None of the above.

52) Consider a country that can be described by the IS/LM model, in which the central bank chooses a value for the money supply and the price level is fixed. What happens to output Y and the real interest rate r in response to an increase in the amount of real money balances people would want to hold at any given interest rate and income? Hint: draw a graph!
a) Y up, r down.
b) Y up, r up.
c) Y down, r down.
d) Y down, r up.
e None of the above.

53) Consider a country that can be described by the IS/LM model, in which the central bank chooses a value for the money supply and the price level is fixed. What happens to output Y and the real interest rate r in response to an increase in the amount of investment spending firms would want to undertake at any given value of the real interest rate? Hint: draw a graph!
a) Y up, r down.
b) Y up, r up.
c) Y down, r down.
d) Y down, r up.
e None of the above.