Economics 362 Macroeconomic Theory
Hanes Spring 2024 Final exam

Look over the whole test before you begin. Good luck!
There are 62 multiple choice questions for one point each, and one written question for 16 points.

1) Which of the following statistics would be best to indicate changes in the prices paid by your family for the things your parents buy?
a) Nominal GDP b) Nominal GNP c) GDP price index d) CPI
e) Chained (2012) dollar real GDP estimate

2)Which of the following statistics would be best to indicate the total dollar income of U.S. residents?
a) Nominal GDP b) Nominal GNP c) Real GDP index d) CPI
e) Chained (2012) dollar real GDP estimate

3) Which of the following statistics represents the total dollar value of final goods and services produced within U.S. borders?
a) Nominal GDP b) Nominal GNP c) Real GDP index d) CPI
e) Chained (2012) dollar real GDP estimate

4) Which of the following statistics most closely represents total value added by all enterprises located in the U.S.?
a) Nominal GDP b) Nominal GNP c) Real GDP index d) CPI
e) Chained (2012) dollar real GDP estimate

5) Which of the following statistics is affected by year-to-year changes in prices *and* by year-to-year changes in quantities?
a) Nominal GDP b) Real GDP index c) CPI d) Chained (2012) dollar real GDP estimate e) Unemployment rate

6) Which of the following statistics is affected only by year-to-year changes in prices?
a) Nominal GDP b) Real GDP index c) CPI d) Chained (2012) dollar real GDP estimate e) Unemployment rate

7) In this table, what should the last column be?

Year	Real GDP Quantity index	Nominal GDP	Chained (2012) dollar real GDP
2011	0.90	1000	_____
2012	1.00	2000	_____
2013	1.10	2050	_____

Year	a)	b)	c)	d)
2011	1000	1900	1800	1700
2012	2000	2000	2000	2000
2013	2050	2100	2200	2300

e) none of those is correct

8) Which of the following is true for the Cobb-Douglas production function?
a) It has constant returns to scale
b) It has diminishing marginal product of labor
c) It has diminishing marginal product of capital
d) All of the above
e) None of the above

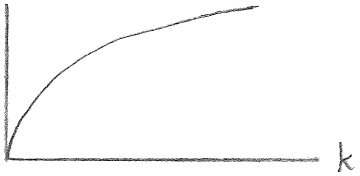
9) What happens to the statistical unemployment rate if there is no change in the number of people employed, but many people without jobs give up looking for work?
a) Increase b) Decrease c) No change d) Depends on the value of the NAIRU e) None of the above

10) What happens to the statistical unemployment rate if many people employed in large companies leave those jobs and become self-employed?
a) Increase b) Decrease c) No change d) Depends the value of the NAIRU e) None of the above

11) What type of price index formula tends to show the highest rate of inflation?
a) Paasche b) Laspeyres c) Fisher d) No formula tends to show a higher rate of inflation than other formulas
e) It depends on whether prices are falling or rising

12) What type of formula is used to construct the GDP price index?
a) Paasche b) Laspeyres c) Fisher (chain-weighted) d) A mix of Laspeyres and Fisher (chain-weighted)
e) None of the above

13) Think of the graph we use to describe the "Solow model" of economic growth. Why is the *f(k)* line bowed down (concave), shaped like:



Because of:
a) constant returns to scale b) diminishing marginal product of labor c) diminishing marginal product of capital
d) a fixed savings rate e) None of the above

The following information is for questions 14)- 19), about value-added and GDP. There are three industries in Batavia: wheat-growing, coal mining and the manufacture of shovels. Coal mines sell coal to households and to shovel-manufacturers. Wheat farms sell only to households. Shovel-manufacturers sell only to coal mines and wheat farms. Fill out this table, then answer the questions.

	Sales revenue	Wages of employees	Purchases of shovels	Purchases of coal	Value-added
Coal mining	8	2	4	0	_____
Wheat farming	10	6	2	0	_____
Shovel manufacture	6	2	0	2	_____

GDP _____

14) What is value-added in coal mining? a) 2 b) 4 c) 6 d) 8 e) None of the above

15) What is value-added in wheat farming? a) 2 b) 4 c) 6 d) 8 e) None of the above

16) What is value-added in shovel manufacture? a) 2 b) 4 c) 6 d) 8 e) None of the above

17) What is GDP? a) 6 b) 8 c) 10 d) 12 e) None of the above

18) What items would be included in a CPI for Batavia?
a) Coal, wheat and shovels b) Coal and wheat c) Coal and shovels d) Wheat and shovels e) Wheat

19) What items would be included in a GDP price index for Batavia?
a) Coal, wheat and shovels b) Coal and wheat c) Coal and shovels d) Wheat and shovels e) Wheat

What is the marginal product of *capital* for each of the following aggregate production functions? Choose answers from the list below. Hint: use calculus to get the marginal product of capital and write that next to the production function. Then choose the answer from the list. Note: an answer on the list may be correct for several production functions.

20) $Y = 3K + 2L$

21) $Y = 100KL$

22) $Y = 100KL + L^2$

23) $Y = K^{1/2} + L^{1/2}$

24) $Y = 10 + 3K + L^2$

25) $Y = LK^{1/3} + 2K$

Possible answers: a) $L\frac{1}{3}K^{-2/3} + 2$ b) 100L c) $100L + 2L$ d) $\frac{1}{2}K^{-1/2}$ e) None of the above

26) If dollars are the "unit of account" in an economy, what does that mean?
a) Dollars are used as an "in-between" good to make all trades
b) Holding dollars is an easy way to save
c) Prices of things are quoted in dollars
d) *All* of those things mean that dollars are the "unit of account"
e) *None* of those things is related to dollars being the "unit of account."

27) If dollars are the "medium of exchange" in an economy, what does that mean?
a) Dollars are used as an "in-between" good to make all trades
b) Holding dollars is an easy way to save
c) Prices of things are quoted in dollars
d) *All* of those things mean that dollars are the "medium of exchange"
e) *None* of those things is related to dollars being the "medium of exchange."

For 28) and 29), suppose that each of the following economies is described by the Solow model of economic growth.

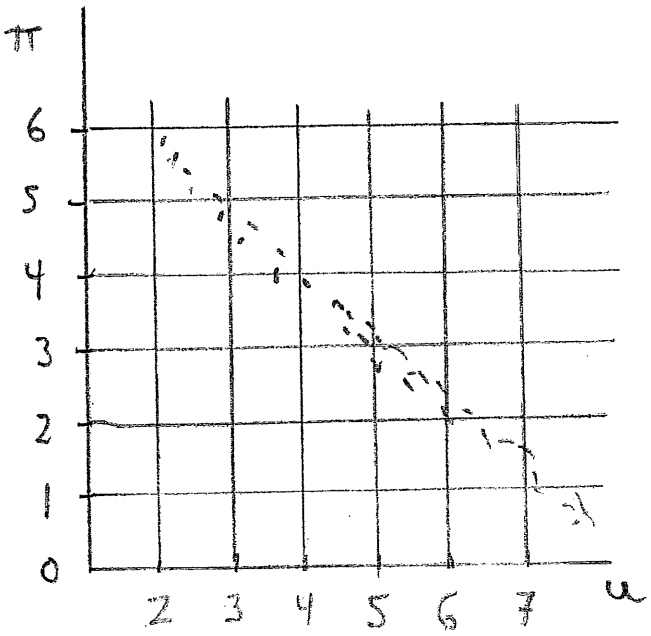
	MPK	δ	n
Economy I	10%	5%	1%
Economy II	8%	5%	1%
Economy III	6%	5%	2%
Economy IV	8%	5%	4%

28) In which of the economies would an *increase* in the savings rate tend to *boost* consumption per person in the long-run steady state?
a) I, II b) I, II, III c) IV d) III, IV e) I, II, III, IV

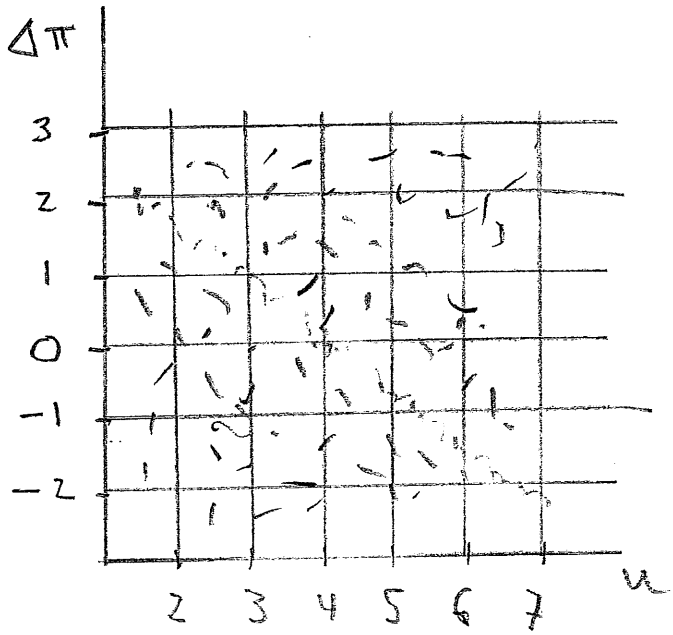
29) In which of the economies would an *increase* in the savings rate tend to *boost* capital per person in the long-run steady state?
a) I, II b) I, II, III c) IV d) III, IV e) I, II, III, IV

The following graphs, for 30) - 33), are scatterplots of statistics about inflation π and the unemployment rate u from two different economies: economy I and economy II. u is on the horizontal axis, π or $\Delta\pi$ on the vertical axis.

I



also I



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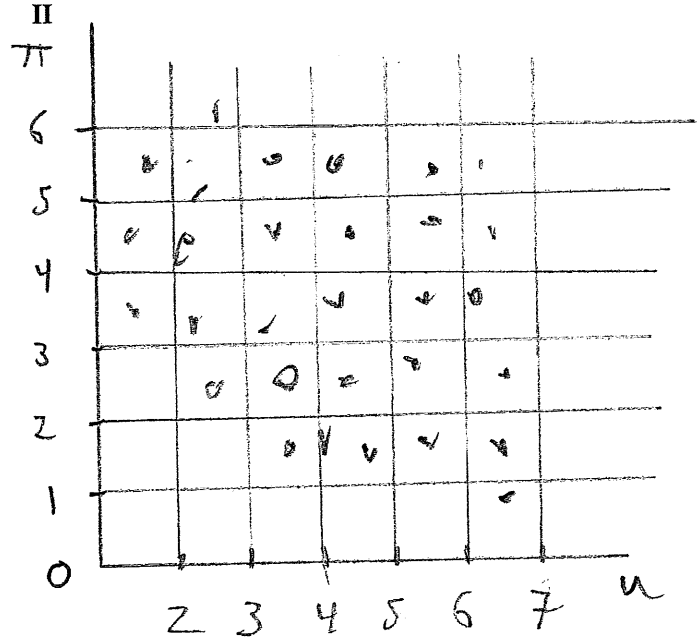

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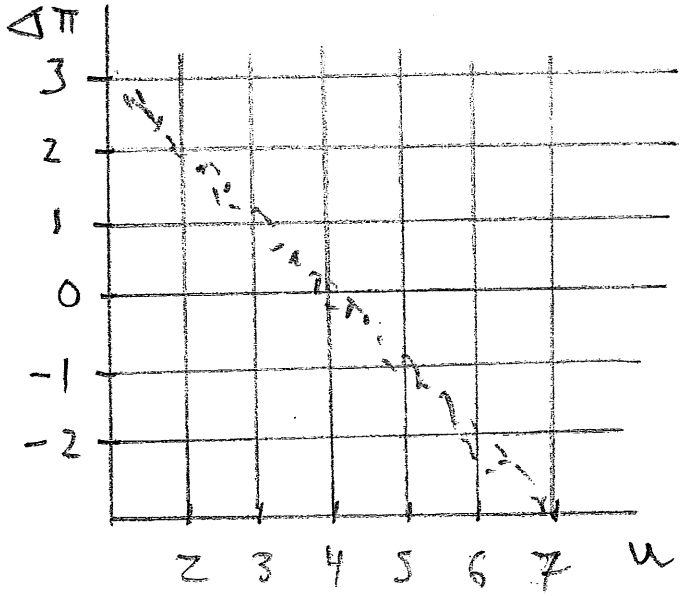


30) Which economies have "adaptive" expectations? a) I b) II c) Both d) Neither e) Need more information to answer this question

31) Which economies have "anchored" expectations? a) I b) II c) Both d) Neither e) Need more information to answer this question

32) In economy II, what is the "natural rate of unemployment" or NAIRU? a) 3 percent b) 4 percent c) 5 percent e) Need more information to answer this question

33) Suppose you know that in economy I the natural rate of unemployment is 5 percent. Then what is expected future inflation in economy I? a) 2 percent b) 3 percent c) 4 percent d) 5 percent e) Need more information

The following information is for questions 34)-36). Consider the effect of the following events on a closed economy's economy's natural rate of interest $\overline{r}$, assuming there is no change in the natural rate of output $\overline{Y}$.

I The government increases its purchases of goods and services
II The government increases taxes
III An increase in expected lifespans makes people want to save more at any given disposable income
IV A decrease in the supply of real money balances
V An increase in the supply of real money balances

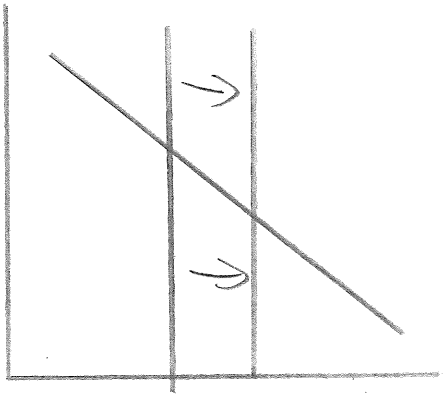
34) Which of the events tend to *increase* the natural rate of interest $\overline{r}$?
a) I only b) I & III c) I & IV d) II & V e) I & V

35) Which of the events tend to *decrease* the natural rate of interest $\overline{r}$?
a) II only b) II & III c) II and IV d) II, III and IV e) II, III and V

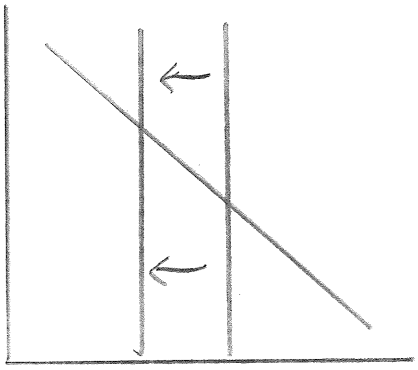
36) Which of the events has no effect on the natural rate of interest $\overline{r}$?
a) They *all* affect the natural rate of interest $\overline{r}$
b) I and II c) II and III d) III and IV e) IV and V

The following information is for 37)-40). These four "money market" graphs depict the supply and demand for real money balances. Below, I will ask you which graph depicts a particular event. More than one event may correspond to a given graph.

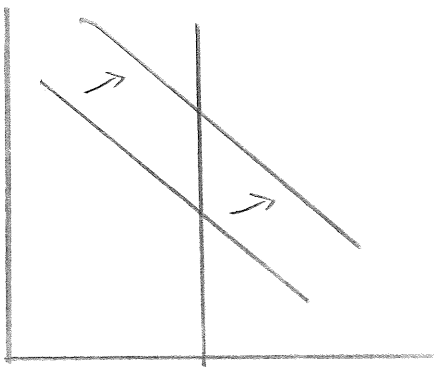
a)



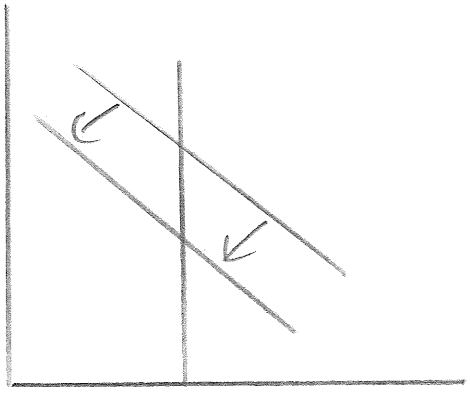
b)



c)



d)



Which graph depicts each of the following events, assuming nothing else changes?

37) The central bank buys bonds in "open market operations." a) b) c) d) e) None of the above

38) The price level P increases. a) b) c) d) e) None of the above

39) Real income Y increases. a) b) c) d) e) None of the above

40) The Federal Reserve requires banks to hold minimum balances in their reserve accounts, so that banks need to hold more in their reserve accounts at any given interest rate. a) b) c) d) e) None of the above.

The following information is for 41)-44). The four graphs below the combination of IS and LM curves for an economy in which the central bank policy committee chooses a value for the money supply, not the interest rate. For each of the following events, choose the graph that illustrates that event.

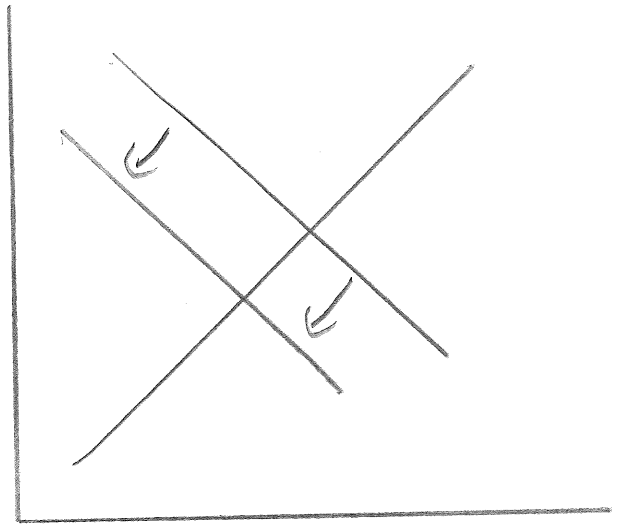
41) There is an increase in the price level P. a) b) c) d) e) None of the above

42) The central bank policy committee increases the money supply M^S. a) b) c) d) e) None of the above

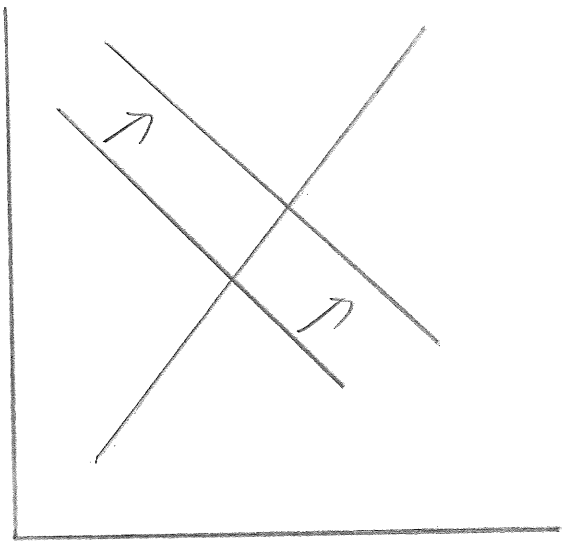
43) The central bank requires banks to hold minimum balances in their reserve accounts, so that banks need to hold more in their reserve accounts at any given interest rate. a) b) c) d) e) None of the above.

44) There is an increase in government purchases of goods and services G. a) b) c) d) e) None of the above.

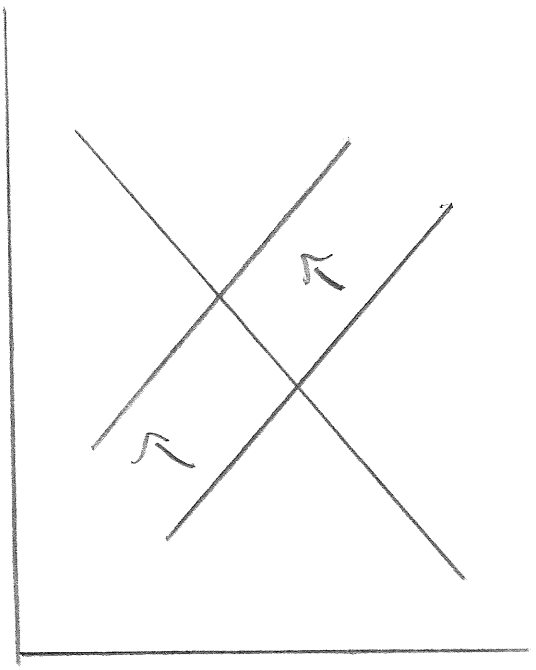
a)



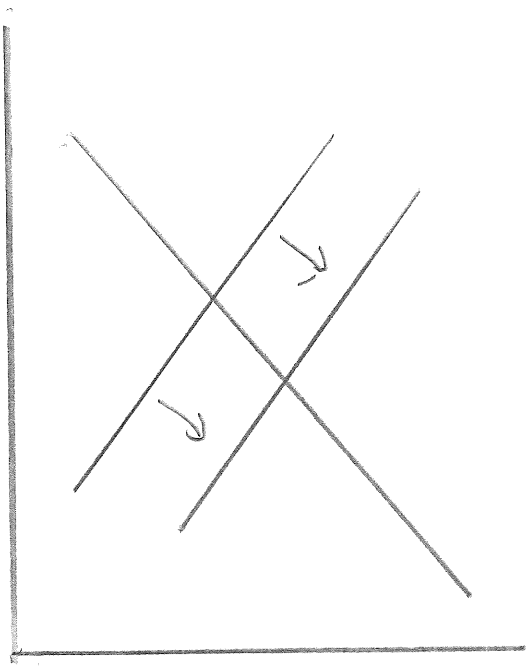
b)



c)



d)



For 45)- 49), consider a small open economy in the long run (that is, assume $Y = \bar{Y}$). The graphs below illustrate possible events in that economy. For each of the following events, choose the set of graphs that illustrate that event. Assume that "before" the event, the economy had balanced trade.

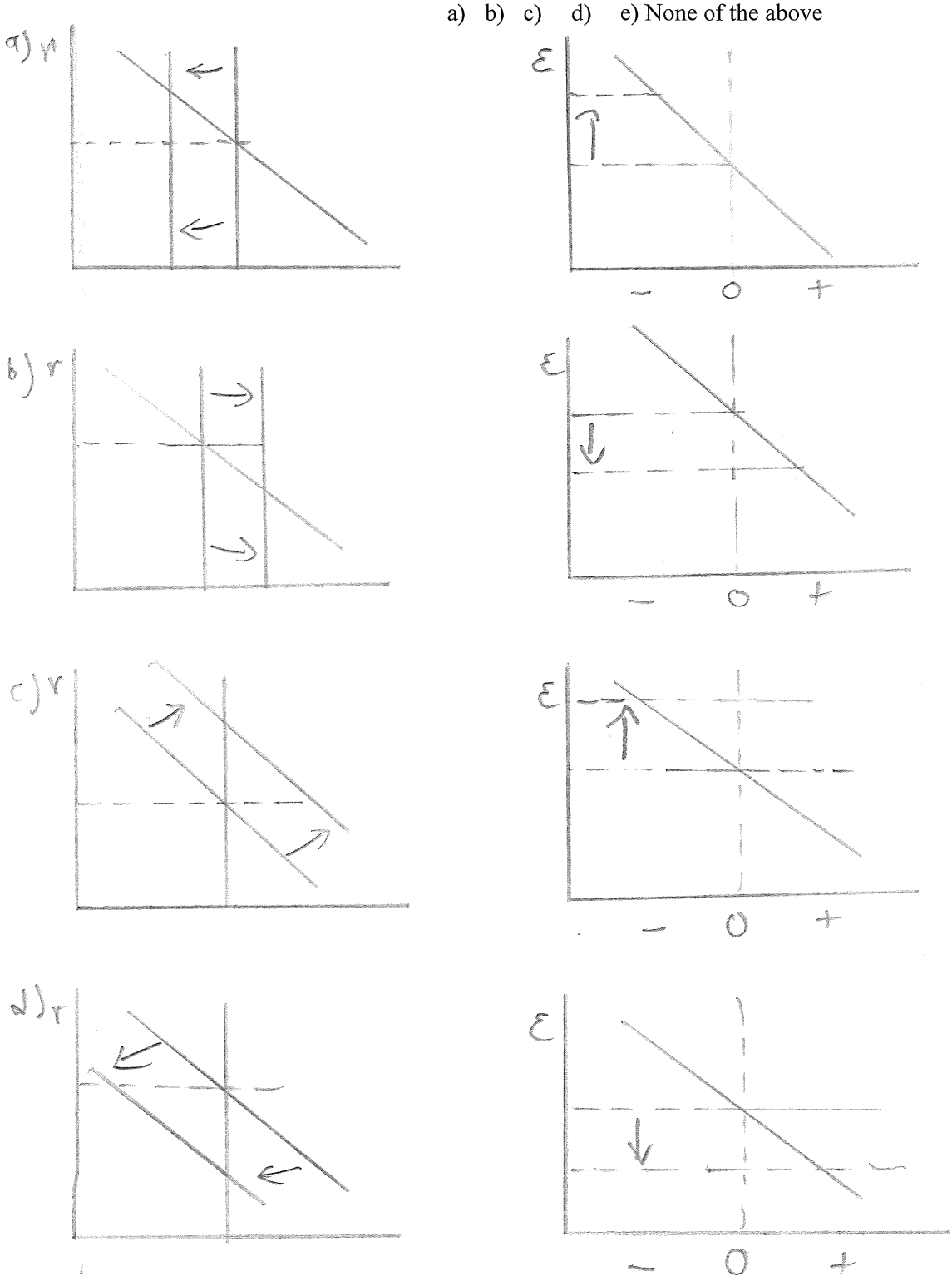
45) There is an increase in government purchases of goods and services. a) b) c) d) e) None of the above

46) There is an increase in demand for the country's exports at any given exchange rate.
a) b) c) d) e) None of the above

47) There is an increase in government transfer spending. a) b) c) d) e) None of the above

48) There is a decrease in investment spending at any given interest rate (for example, $I = c - dr$ and c decreases).
a) b) c) d) e) None of the above

49) There is a decrease in demand for the country's exports at any given exchange rate.
a) b) c) d) e) None of the above



The following information is for 50)-53). Think about an economy in which the central bank policy committee chooses an interest rate and adjusts the money supply as needed to keep the interest rate at that chosen value. The central bank always tries to keep inflation exactly equal to a target inflation rate of 2 percent. The natural rate of unemployment (NAIRU) u^n is 6 percent. For each situation below, consider the value that the central bank will choose for the interest rate, and what the results will be for the unemployment rate and inflation. Assume that the central bank always knows the true value of potential output $\overline{Y}$.

50) The public's expected value for future inflation is 2 percent. Government purchases, taxes net of transfers and other determinants of spending all turn out to be as the central bank expected when it set the interest rate. Result?
a) u = 6 percent, inflation = 2 percent
b) u< 6 percent, inflation > 2 percent.
c) u > 6 percent, inflation < 2 percent.
d) u = 6 percent, inflation > 2 percent.
e) u = 6 percent, inflation < 2 percent.

51) The public's expected value for future inflation is 1 percent. Government purchases, taxes net of transfers and other determinants of spending all turn out to be as the central bank expected when it set the interest rate. Result?
a) u = 6 percent, inflation = 1 percent
b) u< 6 percent, inflation > 1 percent.
c) u > 6 percent, inflation < 1 percent.
d) u = 6 percent, inflation > 1 percent.
e) None of the above.

52) The public's expected value for future inflation is 3 percent. Government purchases, taxes net of transfers and other determinants of spending all turn out to be as the central bank expected when it set the interest rate. Result?
a) u = 6 percent, inflation = 3 percent
b) u< 6 percent, inflation > 3 percent.
c) u > 6 percent, inflation < 3 percent.
d) u = 6 percent, inflation > 3 percent.
e) None of the above.

53) The public's expected value for future inflation is 2 percent. Government purchases turn out to be *more* than the central bank expected when it set the interest rate. Result?
a) u = 6 percent, inflation = 2 percent
b) u< 6 percent, inflation > 2 percent.
c) u > 6 percent, inflation < 2 percent.
d) u = 6 percent, inflation > 2 percent.
e) None of the above.

The following information is for questions 54)- 55). Consider the long-run equilibrium rate of unemployment in an economy. Like the model we used in class,
U is the number of unemployed people in the economy.
L is the number of people in the labor force (which is fixed, does not grow over time).
E is the number of employed people.
u is the unemployment rate (expressed as a fraction or decimal).
Also like the model we used in class, the number of unemployed people who become employed in a period is fU where f is a fraction less than one. *Unlike* in class, the number of employed people who become unemployed in a period is sE-zU, where s and z are fractions less than one.

54) What might be a reason that the number of employed who become unemployed is sE-zU?
a) More employed people quit their jobs when unemployment is higher
b) Fewer employed people quit their jobs when unemployment is higher
c) The number of people quitting their jobs is unrelated to the number of unemployment
d) More employed people who screw off on the job is lower when unemployment is higher
e) None of the above

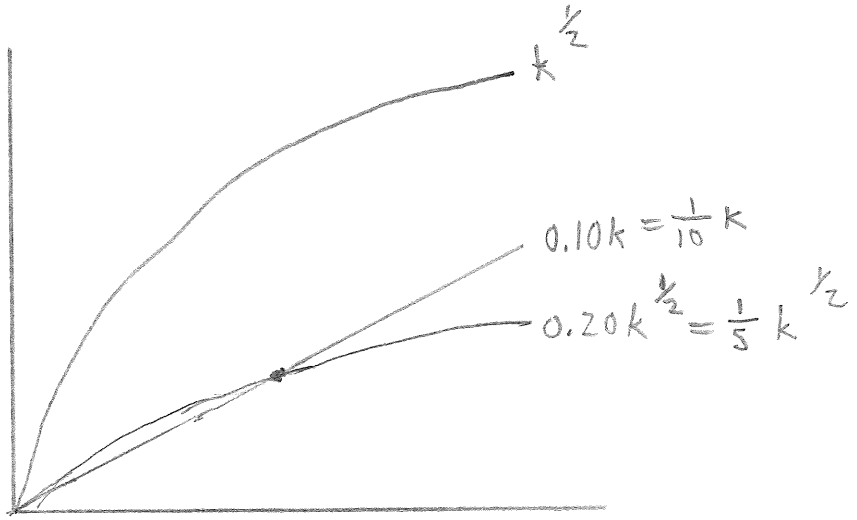
55) Suppose I asked you to derive the long-run equilibrium unemployment rate in this economy. What is the first line of math you would write down? Hint: write down the first line in the space below, then choose the answer that matches what you wrote.

a) $sE = fU$ b) $sE - zU = fU$ c) $sE = fU - zU$ d) $sE + zL = fU$ e) None of the above

56) Starting from your answer to 55), derive the long-run unemployment rate u in the space below. What is u?

a) $u = \frac{f}{f+s+z}$ b) $u = \frac{s}{f+s+z}$ c) $u = \frac{f+s+z}{s}$ d) $u = \frac{s}{f+s}$ e) None of the above

This information is for questions 57) - 62).
The graph to the right describes an economy following the Solow growth model.
Answer the questions below.
I am looking for numerical answers. Use the space below for your math.



57) What is the long-run steady state capital stock k*? a) 2 b) 3 c) 4 d) 5 e) None of the above.
58) What is long-run steady state output y*? a) 2 b) 3 c) 4 d) 5 e) None of the above.
59) What is long-run steady state consumption c*? a) 2 b) 3 c) 4 d) 5 e) None of the above.
60) What is the golden rule capital stock k^*_{gold} a) 2 b) 3 c) 4 d) 5 e) None of the above.
61) What is golden rule output y^*_{gold}? a) 2 b) 3 c) 4 d) 5 e) None of the above.
62) What is golden rule consumption c^*_{gold}? a) 2 b) 3 c) 4 d) 5 e) None of the above.

Written question

Consider a closed economy that is similar to the model we have used in class in that:

$C = a + b(Y - T)$ consumption function

$T = \overline{T}$ (taxes net of transfers is exogenous)

$G = \overline{G}$

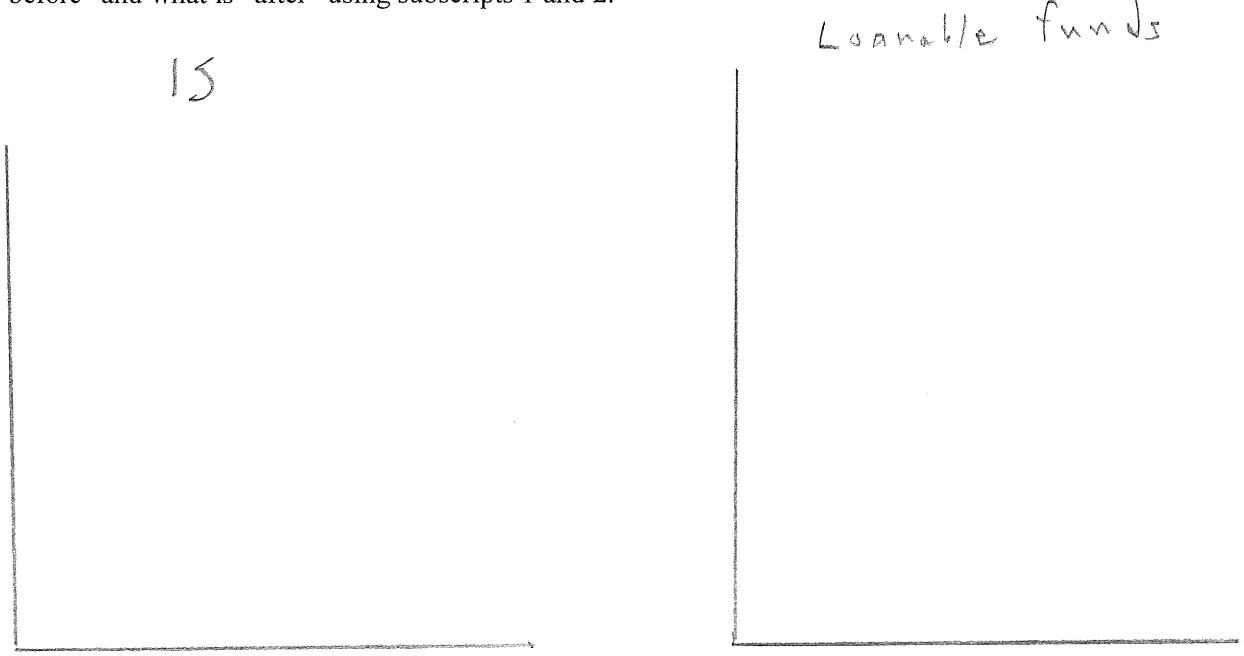
But unlike the model we used in class, the investment function is *not* $I = c - dr$.

The investment function is instead $I = c - dr + zY$ where z (a positive number) is a coefficient. This is because an increase in demand for final output (that is, Y) increases firms' sales and hence the return to investment spending.

a) 4 pts. Using algebra, derive the "equation of the IS curve," that is an equation with r alone on the left-hand side and Y on the right-hand side along with other stuff. (Note: this is not the "spending equation" equation with Y on the left-hand side.)

b) 4 pts. Think about how this IS curve is different from the one from the model in class, that is the IS curve containing an assumption that $I = c - dr$. Is the slope of this IS curve the same as the one from the class model, or different? Explain how you know, based on your answer to a).

c) 4 pts. Think about the IS curve along with the *loanable funds graph* for this new economy. Consider the *long run* of the new economy, that is assuming output Y is held equal to potential output $\overline{Y}$. On the two sets of axes below, draw what happens in the long run of the economy when there is an increase in government purchases G. Clearly indicate what is "before" and what is "after" using subscripts 1 and 2.



d) 4 pts. Now consider the IS curve and the loanable funds graph in the *short run* of the new economy, holding r fixed and allowing Y to differ from $\overline{Y}$. On the two sets of axes below, draw what happens in the long run of the economy when there is an increase in government purchases G. Clearly indicate what is "before" and what is "after" using subscripts 1 and 2.