Fall 2022 Second midterm

There are 27 multiple choice questions for 1 pt. each, and four written questions for a total of 30 points. Total points: 57. Look over the whole test before you begin. Good luck!

1) The term "efficiency wages" refers to the possibility that:
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) it takes time for a person looking for a job to interview, get a job offer and decide to take a job offer rather than keep looking
e) none of the above

2) "Frictional unemployment" is unemployment that results from the fact that:
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) it takes time for a person looking for a job to interview, get a job offer and decide to take a job offer rather than keep looking
e) none of the above

3) What happens to the real exchange rate ϵ (as defined in class) if the nominal exchange rate e does not change, the domestic price level P does not change, and the foreign price level P^* increases?
a) ϵ increases b) ϵ decreases c) ϵ does not change d) I need more information to say e) None of the above

The following information is for 4) - 6). Consider a closed economy in which:

$$Y = C + I + G$$
$$C = 3 + 0.5(Y - T)$$
$$I = 4 - 2r$$
$$G = 10$$
$$T = 9$$

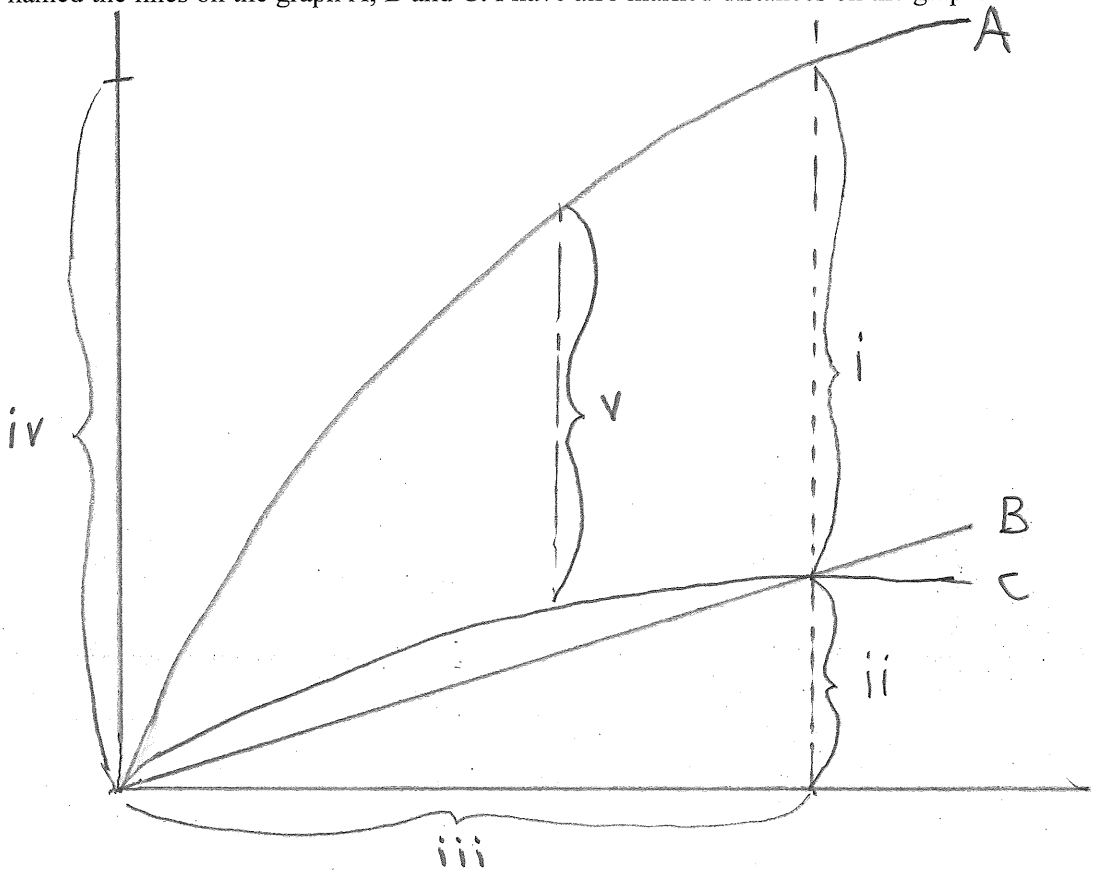
4) What is the "marginal propensity to consume" in this economy?
a) 3 b) 0.5 c) 4 d) 2 e) None of the above

5) If Y increases from 10 units to 14 units, what will happen to C?
a) Increase by 1 unit b) Increase by 2 units c) Increase by 3 units d) Increase by 4 units e) None of the above

6) In this economy, which of the following events would increase the natural rate of interest $\bar{r}$, holding everything else fixed?
I. An increase in government purchases G
II. An increase in taxes net of transfers T
III. An increase in the amount of consumption spending C that would take place at a given value of disposable income $(Y-T)$.
IV. An increase in the amount of investment spending I that would take place at a given value of the real interest rate r.

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

The graph below is for questions 7)-12). It depicts an economy described by the Solow model of economic growth. I have named the lines on the graph A, B and C. I have also marked distances on the graph.



7) What distance represents long-run equilibrium (steady-state) capital per worker?
a) i b) ii c) iii d) iv e) v

8) What distance represents long-run equilibrium (steady state) consumption per worker?
a) i b) ii c) iii d) iv e) v

9) What distance represents long-run equilibrium (steady state) output per worker?
a) i b) ii c) iii d) iv e) v

10) What distance represents long-run equilibrium (steady state) savings per worker?
a) i b) ii c) iii d) iv e) v

For 11) and 12), suppose the function plotted out by Line A is specifically $k^{1/3}$
the function plotted out by line B is specifically $0.05\,k$
the function plotted out by Line C is specifically $0.10k^{1/3}$

11) What is the depreciation rate δ in this economy, assuming there is *no* population growth?
a) 0.05 b) 0.10 c) 1/3 d) 2/3 e) I was not given that information

12) What is the savings rate s in this economy?
a) 0.05 b) 0.10 c) 1/3 d) 2/3 e) I was not given that information

For 13) and 14), 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%

13) In which 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

14) In which 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 information is for 15)-17). 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. Consider how each of the following events affects y, y^*, and 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, without killing anyome.

15) Which of those events changes long-run steady-state output per worker y^*?

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

16) Which of those events changes output per worker in the Golden Rule state y^*_{gold} ?

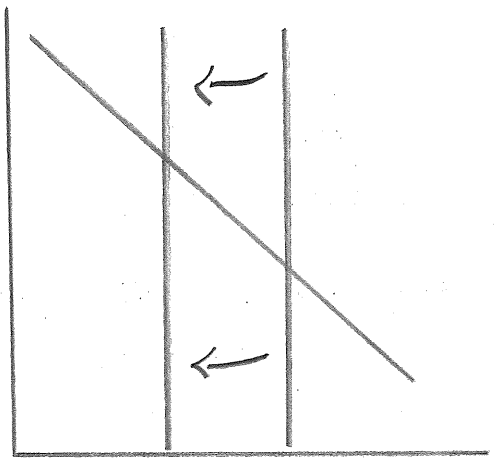
a) I, II, III, IV b) I, II, III only c) I, II only d) III and IV only e) IV only

17) Which of the events changes output per worker y in the short run but does NOT change y^*?

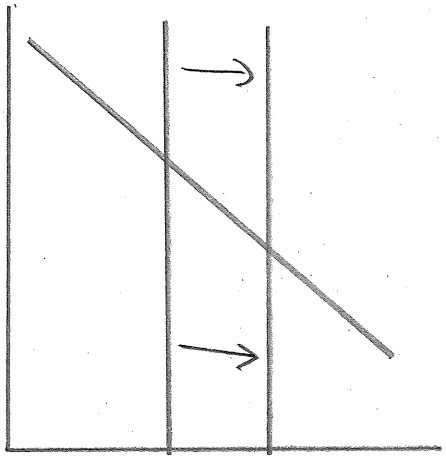
a) I, II, III, IV b) I, II, III only c) I, II only d) III and IV only e) IV only

The following information is for 18) - 21). These four "loanable funds" graphs depict possible events in a closed economy in which output is always equal to potential output (natural rate of output). Below, I will ask you to tell me which graph corresponds to a particular event. More than one event may correspond to a given graph. Hint: start by writing down an equation for national savings $\overline{S}$.

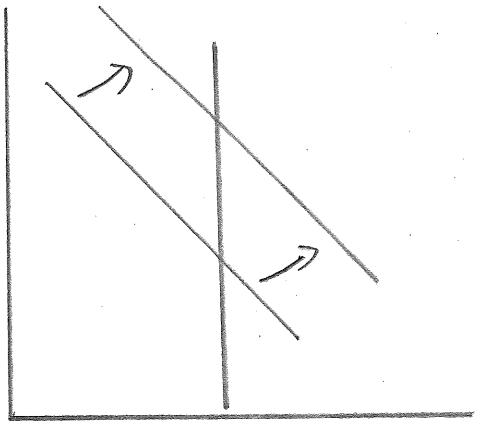
a)



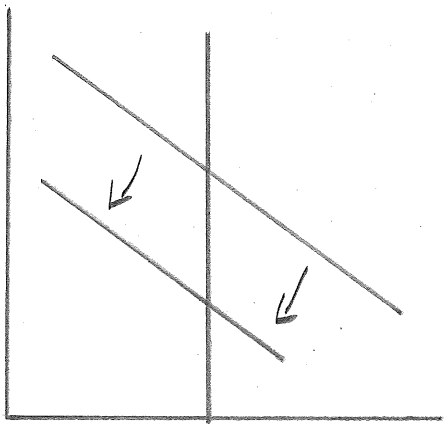
b)



c)



d)



Which graph corresponds to each of the following events?

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

19) There is an increase in taxes net of transfers.
a) b) c) d) e) None of the above

20) New software is developed which many firms want to buy.
a) b) c) d) e) None of the above

21) $C = a + b(Y\text{-}T)$ and there is a decrease in a.
a) b) c) d) e) None of the above

For 22)- 26), consider a small open economy in the long run (that is, assume $Y = \overline{Y}$). In this economy, as in class:

$$Y = C + I + G + NX \qquad C = a + b(Y - T) \qquad I = c - dr \qquad G = \overline{G} \qquad T = \overline{T}$$

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: in the spaces I left below draw graphs, and for simplicity assume that "before" the economy is in a state of *balanced trade*.

22) There is a decrease in government purchases of goods and services.

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) None of the above.

23) There is a decrease in transfer spending (e.g., a decrease in Social Security payments).

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) None of the above.

24) Foreign demand for the economy's exports decreases, so the value of exports would be larger at any given real exchange rate.

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) None of the above.

25) The domestic government imposes tariffs on imported goods, so domestic demand for imports would be smaller at any given real exchange rate.

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) None of the above.

26) There is a reduction in investment opportunities in the economy, so that investment spending is lower at any given real interest rate.

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) None of the above.

27) There is an increase in the world real interest rate r^*.

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) None of the above.

Written questions

I) 5 pts. Consider an economy described by the Solow model of economic growth. The aggregate production function is: $Y = 2K + 100L$. The depreciation rate is 1/10 (10 percent). The population (or labor force) growth rate is also 1/10 (10 percent). The savings rate is 1/20 (5 percent). What is the value of k^*, capital per worker in the long-run steady state? I am looking for a specific actual number. Show your calculations below.

II) 5 pts. Consider an economy described by the Solow model of economic growth. The aggregate production function is: $Y = 4K^{1/2}L^{1/2}$. The depreciation rate is 1/4 (25 percent). The population (or labor force) growth rate is also 1/4 (25 percent). What is the value of k^*_{Gold}, that is the "golden rule" value of capital per worker? I am looking for a specific actual number. Show your calculations below.

III) 10 pts. This question is about job finding, job separation and the equilibrium unemployment rate.
As in our class discussion, let U denote the total number of unemployed people and E denote the total number of employed people so that the labor force $L = U + E$. The number of people in the labor force is fixed.
The unemployment rate is $u = U/L$.
The number of unemployed people finding jobs in a period is fU where f is a fraction (between zero and one).
The number of people becoming unemployed in a period is *different* from the model presented in class.
Here it is sE-gU where s is a fraction (between zero and one) and g is a coefficient that expresses the following effect: when more people are unemployment, employed people are less likely to quit.
Derive the long-run equilibrium value of the unemployment rate u. Show your work!

IV) Consider a "closed economy" in which

$Y = C + I + G$ $\quad C = a + b(Y - T)$ $\quad I = c - dr$ $\quad G = \overline{G}$ $\quad T = tY$ where $0 < t < 1$

Notice that this economy is *different* from the one we described in class. Here, taxes net of transfers T is not an exogenous variable. T is instead *a share* (a fraction) of real GDP denoted t, such as 0.10 (one tenth) or 0.20 (one fifth).

a) 5 pts. Using algebra, derive the equation that gives the natural rate of interest $\overline{r}$ as a function of $\overline{G}$, $\overline{Y}$ etc.

b) 5 pts. Using algebra, derive the equation that gives national savings S when output is equal to the natural rate of output $\overline{Y}$. (We called this $\overline{S}$.)