Name: _____

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ECON 1210 | Fall 2017

MIDTERM EXAM 1

Duration: 50 minutes
Total: 100 points
A simple calculator is allowed. Phones, laptops, notes, and textbook are not allowed.

Multiple-choice questions [4 point each | 60 points total]

Select **the one alternative** that best answers the question or completes the statement. Write your answers in the designated places. Answers that are **not in the designated places will not receive any credit.**

1) Suppose that consumption C is a function of disposable income D given by C=1000+0.5 x D. Then private saving S is a function of disposable income D given by
A) S = -1000 + 0.25 x D.
B) S = -250 + 0.5 x D.
C) S = -1000 + 0.5 x D.
D) S = -1000 + 0.75 x D.
E) S = -1000 - 0.5 x D.

ANSWER:_____

2) Consider the IS module with fixed investment I. Suppose that the marginal propensity to consume equals 0.5. Which of the following events will cause the largest increase in output?
A) G increases by 200
B) T decreases by 200
C) I increases by 150
D) I increases by 250
E) both A and B

ANSWER:_____

3) A firm's value added equals
A) its revenue minus all of its costs.
B) its revenue minus its wages.
C) its revenue minus its wages and profit.
D) the value of its research and development.
E) its revenue minus its cost of intermediate goods.

ANSWER:_____

4) If nominal GDP rises by 15 percent between 1991 and 1992, while the GDP deflator rises by 5 percent between 1991 and 1992, the percentage change in real GDP between 1991 and 1992 is approximately equal to
A) 10 percent.
B) -5 percent.
C) 5 percent.
D) 15 percent.
E) 20 percent.

ANSWER:_____

5) What is included in central bank money?
A) bonds held by banks, bank loans, and bank reserves
B) only government bonds
C) currency in circulation plus bank reserves
D) currency in circulation plus checkable deposits
E) bonds held by the central bank plus currency in circulation

ANSWER:_____

6) Consider the LM module without financial intermediaries. An open market sale of bonds by the central bank causes which of the following?
A) The interest rate increases.
B) The interest rate does not change.

C) The interest rate increases.
D) The demand for central bank money increases.
E) The supply of central bank money increases.

ANSWER:_____

7) Consider the LM module without financial intermediaries. The money demand curve will shift to the left when which of the following occurs?
A) a reduction in the interest rate
B) an increase in the interest rate
C) an open market purchase of bonds by the central bank
D) an increase in income
E) an decrease in income

ANSWER:_____

8) In 2014, output per capita in the United States was approximately equal to
A) $15,000.
B) $25,000.
C) $35,000.
D) $55,000.
E) $105,000.

ANSWER:_____

9) How does the central bank usually pursue expansionary monetary policy?
A) The central bank purchases bonds to increase the interest rate.
B) The central bank purchases bonds to decrease the interest rate.
C) The central bank purchases government bonds to reduce government deficit.
D) The central bank sells bonds to increase the interest rate.
E) The central bank sells bonds to decrease the interest rate.

ANSWER:_____

10) One of the lawful mandates of the US government is to
A) stabilize prices so that inflation is zero.

B) stabilize employment so that the unemployment rate remains constant.
C) stabilize the economy at "full employment".
D) avoid government budget deficit.
E) none of the above.

ANSWER:_____

11) Consider the IS module with fixed investment I. Assume that the consumption function is $C = c_0 + c_1 \times D$. We know that a decrease in c_1 causes

A) autonomous expenditure and thus output to decrease.
B) the expenditure line Z(Y) to become steeper and a change in autonomous consumption (c_0) to have a smaller effect on output.
C) the expenditure line Z(Y) to become steeper and a change in autonomous consumption (c_0) to have a larger effect on output.
D) the expenditure line Z(Y) to become flatter and a change in autonomous consumption (c_0) to have a smaller effect on output.
E) the expenditure line Z(Y) to become flatter and a change in autonomous consumption (c_0) to have a larger effect on output.

ANSWER:_____

12) Consider the LM module without financial intermediaries. If there is no central bank intervention, an increase in income causes
A) a decrease in bond prices and a decrease in the interest rate.
B) a decrease in bond prices and an increase in the interest rate.
C) an increase in bond prices and a decrease in the interest rate.
D) an increase in bond prices and an increase in the interest rate.
E) none of the above, because income equals expenditure in equilibrium.

ANSWER:_____

13) In the IS module, an equal and simultaneous reduction in G and T will cause
A) an increase in consumption.
B) an increase in autonomous expenditure.
C) no change in consumption.

D) a reduction in consumption.
E) no change in autonomous expenditure.

ANSWER:_____

14) In a given year, suppose a company spends $400 million on intermediate goods, $200 million on wages, with $300 million in profits. Also assume that its total sales are $900 million. The value added by this company equals
A) $900 million.
B) $700 million.
C) $600 million.
D) $300 million.
E) none of the above.

ANSWER:_____

15) When the economy is in equilibrium, we know with certainty that
A) public saving equals investment.
B) private saving equals investment.
C) G = T.
D) total saving equals investment.
E) expenditure equals investment plus saving.

ANSWER:_____

Problems [20 points each | 40 points total]

Show **all your work** in the space provided, and box your answers. Correct answers **without derivations will only receive partial credit**.

16) Consider an economy represented by the following behavioral equations:

$Z = C + I + G$

$C = 200 + 0.5 \times (Y-T)$

$T = 100$

$I = 100 + 0.1 \times Y$

$G = 200$

A) Briefly describe all the variables and equations in the model.
B) Calculate the equilibrium level of output. Illustrate your calculation using the IS diagram.
C) Now, assume that government expenditure decreases from 200 to 100. What is the new equilibrium level of output? How much do consumption and investment change as a result of this event?
D) Graphically illustrate the effects of this change in government expenditure in the IS diagram. Clearly indicate in your graph the initial and the final equilibrium. Briefly explain why the reduction in output is greater than the initial reduction in government spending.
E) Using the equations, compute the government-spending multiplier.

- extra space -

17) Consider the LM module without financial intermediaries. Suppose that the demand for money is given by $M^d(i) = 200 \times (0.2 - i)$, where i is the interest rate. Suppose that the central bank sets the supply of money to $M^s = 30$.

A) Briefly explain why the money demand is a decreasing function of the interest rate.

B) What is the equilibrium interest rate?

C) If the central bank wants to decrease the interest rate by 5 percentage points, at what level should it set the supply of money?

D) What happens to the interest rate if the central bank decreases the supply of money to $M^s=10$?

E) Briefly explain why central banks cannot set the interest rate at a negative value. What is the name of this constraint? When is this constraint likely to be binding (explain and give a few examples)? What can governments do when this constraint is binding?

- extra space -

Midterm I Solutions

1. Multiple-Choice Questions

1. Suppose consumption $C = 1000 + 0.5D$, the private saving S as a function of disposable income D is given by?
   C. $S = -1000 + 0.5D$

2. Consider the IS module with fixed investment I. Suppose that the MPC is 0.5. Which of the following events will cause the largest increase in output?
   D. I increases by 250

3. A firm's value added equals?
   E. Its revenue minus its cost of intermediate goods

4. If nominal GDP rises by 15% between 1991 and 1992, while the GDP deflator rises by 5% between 1991 and 1992, the percentage change in real GDP between 1991 and 1992 is approximately equal to?
   A. 10 percent

5. What is included in central bank money?
   C. Currency in circulation plus bank reserves.

6. Consider the LM module without financial intermediaries. An open market sale of bonds by the central bank will cause which of the following?
   A. The increase rate increases

7. Consider the LM module without financial intermediaries. The money demand curve will shift to the left when which of the following occurs?
   E. A decrease in income

8. In 2014, output per capita in the United States was approximately equal to?
   D. $55,000

9. How does the central bank usually pursue expansionary policy?
   B. The central bank purchases bonds to decrease the interest rate

10. One of the lawful mandates of the US government is to?
    C. stabilize the economy at "full employment"

11. Consider the IS module with fixed investment I. Assume that the consumption function is $C = c_0 + c_1 D$. We know that a decrease in c_1 will cause?
    D. The expenditure line Z(Y) to become flatter and a given change in autonomous consumption to have a smaller effect on output

12. Consider the LM module without financial intermediaries. If there is no central bank intervention, an increase in income causes?
    B. A decrease in bond prices and an increase in the interest rate

13. In the IS module, an equal and simultaneous reduction in G and T will cause?
    D. A reduction in consumption

14. In a given year, suppose a company spends $400 million on intermediate goods, $200 million on wages, with $300 on profits. Also assume that its total sales are $900 million. The value added by this company equals?
    E. None of the above

15. When the economy is in equilibrium, we know with certainty that?
    D. Total saving equals investment

2. Problems

Question 16
A) Equation 1: $Z = C + I + G$. In a closed economy, total expenditure in the economy is the sum of consumption(C), investment(I) and government spending(G).
Equation 2: $C = 200 + 0.5(Y - T)$. Consumption function has two components - one that depends on disposable income(Y-T), and another that is autonomous, that is, consumption when disposable income is zero (200, here). MPC is 0.5, that is for every additional dollar of disposable income received, consumption increases by \$0.5.
Equation 3: $T = 100$. T is equal to taxes minus transfer payments. It is given exogenously in this problem.
Equation 5: $I = 100 + 0.1Y$. Investment is an increasing function of output. It also has an autonomous component equal to 100 here. It is assumed in this problem that interest-sensitivity of investment is zero.
Equation 6: $G = 200$. Government spending is given exogenously in this problem.

B) The equilibrium level of output is \$1125.

$$\begin{aligned} Y &= C + I + G \\ &= 200 + 0.5(Y - 100) + 100 + 0.1Y + 200 \\ &= 0.6Y + 450 \\ 0.4Y &= 450 \\ Y &= \$1125 \end{aligned}$$

IS diagram:
Expenditure line: upward sloping, intercept 450, slope 0.6; Income line: 45 degrees; Equilibrium output: intersection of income line with the expenditure line.

C) If government spending decreases from 200 to 100, the new equilibrium level of output is \$875. Consumption falls by \$125, and investment falls by \$25

$$\begin{aligned} Y &= C + I + G \\ &= 200 + 0.5(Y - 100) + 100 + 0.1Y + 100 \\ &= 0.6Y + 350 \\ 0.4Y &= 350 \\ Y &= \$875 \end{aligned}$$

$$\begin{aligned} dC &= 0.5 \times dY \\ &= 0.5 \times (-250) \\ &= -125 \end{aligned}$$

$$\begin{aligned} dI &= 0.1 \times dY \\ &= -25 \end{aligned}$$

D) Diagram:

- Y axis: Expenditure/Income, X axis: Income
- Expenditure line (G=200): upward sloping; intercept = 450; slope = 0.6.
- Income line (G=200): 45 degree line through the origin
- Expenditure line (G=100): upward sloping; intercept = 350; slope = 0.6.
- Income line (G=100): 45 degree line through the origin
- Initial equilibrium: Expenditure line (G=200) intersects income line at \$1125 on the X axis
- Final equilibrium: Expenditure line (G=100) intersects income line at \$875 on the X axis

The reduction in output is greater than the initial reduction in government spending due to the multiplier effect, because lower output leads to lower consumption and lower investment in this economy.
E) The government spending multiplier for this economy is 2.5.

$$\begin{aligned} Y &= C + I + G \\ &= 200 + 0.5(Y - 100) + 100 + 0.1Y + G \\ &= 0.6Y + 350 + G \\ 0.4Y &= 450 \\ Y &= \frac{1}{0.4}(350 + G) \\ &= 2.5 \\ \frac{dY}{dG} &= 2.5 \end{aligned}$$

Question 17

A) The demand for money is decreasing in the nominal interest rate because nominal interest rate is the opportunity cost of holding money. By holding money as cash, people let go off the nominal interest rate that they would have received, had they deposited the money in the bank.

B) The equilibrium interest rate is 5%.

$$\begin{aligned} M^s &= M^d \\ 30 &= 200(0.2 - i) \\ &= 40 - 200i \\ i &= 0.05 \end{aligned}$$

C) If the central bank wants to decrease the interest rate by 5 percentage points, the supply of money should be increased to \$40.

$$\begin{aligned} M^s &= 200(0.2 - 0) \\ &= \$40 \end{aligned}$$

D) If money supply is reduced to \$10, then the interest rate increases to 15%.

$$\begin{aligned} 10 &= 200(0.2 - i) \\ i &= 0.15 \end{aligned}$$

E) Central banks cannot set the nominal interest rate at a negative value because money demand does not allow for negative interest rates. Once interest rates become negative, there will be no incentive to hold bonds (useless for transactions and lower returns than money). This constraint is called the zero lower bound. This constraint is likely to bind when there is a recession in the economy. If the central bank increases supply of money too much, interest rate can be pushed up against zero. eg. US Great Recessions, Japan Recession. The government has to use unconventional monetary policies like the QE (Quantitative Easing) to help the economy recover in case of a liquidity trap.