Name: _____

Intermediate Macroeconomics (ECO 3203) – Spring 2026 – Exam 1

Multiple choice questions (60 points). Circle *all* correct answers. There are 3 questions that have more than one or no correct answer: the other 12 have only one. **4 points** for each; no partial credit for some, but not all, correct answers.

1. Market clearing is the assumption that _____.
   - **a.** prices are sticky
   - **b.** prices are flexible
   - **c.** supply always equals demand
   - **d.** the economy is in the short run

2. _____ contribute(s) to the gross domestic product of the United States.
   - **a.** Trading in your car at a dealership in Gainesville
   - **b.** Food stamps
   - **c.** Having dinner at a fancy tapas restaurant on vacation in Madrid
   - **d.** Watching your sister's kids for free

3. There are 2 closed economies, A and B, each without any government spending. Each economy has only one firm. This year, the firm in A produced $10M of final goods and sold $8M. The firm in B also produced $10M of final goods but sold only $7M. Which of the following statements is true?
   - **a.** GDP is higher in economy A, but investment is higher in economy B.
   - **b.** GDP and investment are the same in the two economies.
   - **c.** GDP is the same in both economies, but investment is higher in economy B.
   - **d.** GDP is higher in economy A, but investment is the same in both economies.

4. Which of the following is *not* GDP?
   - **a.** Total income
   - **b.** Total output
   - **c.** Total expenditure
   - **d.** The sum of value added at all stages in the production of final goods

5. Suppose you collect data on a country's annual nominal and real GDP. Real GDP is measured in 2020 prices. Which of the following statements is true?
   a. Real GDP was higher than nominal GDP in 2020.
   b. Real GDP was lower than nominal GDP in 2020.
   c. Real GDP was higher than nominal GDP in 2025.
   d. Whether real or nominal GDP was higher in 2025 depends on inflation.

6. How is the consumer price index constructed?
   a. The BLS computes the ratio of nominal to real GDP.
   b. The BLS tracks the price of a typical consumer's basket of goods over time.
   c. The BLS estimates the value of quality improvements in the basket of goods.
   d. The BLS adjusts labor contracts for inflation ("COLAs").

7. The U.S. Bureau of Labor Statistics classifies _____ as unemployed.
   a. new mothers who stay home for 8 months after childbirth
   b. Lyft drivers
   c. individuals who have been actively searching for a job for 16 months
   d. burnt-out financial analysts taking a gap year

8. Which of the following is an assumption for the loanable funds model?
   a. Perfect competition on the labor market
   b. Monopsony
   c. Sticky prices
   d. Open economy

9. A profit-maximizing firm produces output with a production function that features diminishing marginal returns to all inputs. The firm is in perfect competition for all inputs. Suppose that $MPL \cdot P < W$ and $MPK \cdot P > R$. What should the firm do?
   a. Increase usage of labor and capital.
   b. Decrease usage of labor and capital.
   c. Increase usage of labor, decrease usage of capital.
   d. Decrease usage of labor, increase usage of capital.

10. In the model of aggregate supply and demand, _____ is an endogenous variable.
   a. the real wage
   b. the real rental rate of capital
   c. the equilibrium level of capital
   d. the equilibrium level of output

11. According to 2025 Q3 data from the Federal Reserve Bank of St. Louis, real GDP grew by 1.1 percent, M2 grew by 1.2 percent, and the CPI increased by 0.8 percent. Which statement is correct?

a. These data are in line with the predictions of the quantity theory of money.
b. These data are not in line with the predictions of the quantity theory of money.
c. The Bureau of Economic Analysis must be falsifying data, because there is no way that these data are accurate.
d. Inflation was 0.8 percent.

12. Why can't the government print money freely?

a. Because seigniorage has to be zero.
b. Because it would bankrupt financial institutions.
c. Because it is not the sole issuer of currency.
d. Because money creation to raise the government's revenue causes inflation.

13. The Phillips curve captures the relationship between _____ and _____.

a. inflation, prices
b. inflation, unemployment
c. expected inflation, consumption
d. consumption, employment

14. The U.S. dollar serves the following function of money in Germany: _____.

a. store of value
b. unit of account
c. neutrality of money
d. medium of exchange

15. Which of the following are tools of monetary control?

a. Open-market operations
b. Qualitative easing
c. Capital gains tax
d. Commercial bank supervision

Written response questions. Show your work: if you give the right answer without showing how you arrived at it, you will only get partial credit. If you need more space, use the back of the last page and *clearly indicate* which question you are answering.

1. **(10 points)** Consider the following production function: $F(K, L) = 2 \cdot K^{0.4} L^{0.6}$

   a. **(3 points)** Does this production function have constant returns to scale?

   $$F(zK, zL) = 2 \cdot (zK)^{0.4}(zL)^{0.6} = 2 \cdot z^{0.4+0.6} K^{0.4} L^{0.6}$$
   $$= z \cdot 2 \cdot K^{0.4} L^{0.6} = zF(K, L)$$

   Yes, it has constant returns to scale.

   b. **(2 points)** Does it have diminishing returns to capital?

   $$MPK = \frac{\partial F(K, L)}{\partial K} = 2 \cdot 0.4 \cdot K^{0.4-1} L^{0.6} = 0.8 \cdot K^{-0.6} L^{0.6}$$

   MPK is decreasing in *K*, so yes, it does have diminishing returns to capital.

   c. **(2 points)** Does it have diminishing returns to labor?

   $$MPL = \frac{\partial F(K, L)}{\partial L} = 2 \cdot K^{0.4} \cdot 0.6 \cdot L^{0.6-1} = 1.2 \cdot K^{0.4} L^{-0.4}$$

   MPL is decreasing in *L*, so yes, it does have diminishing returns to labor.

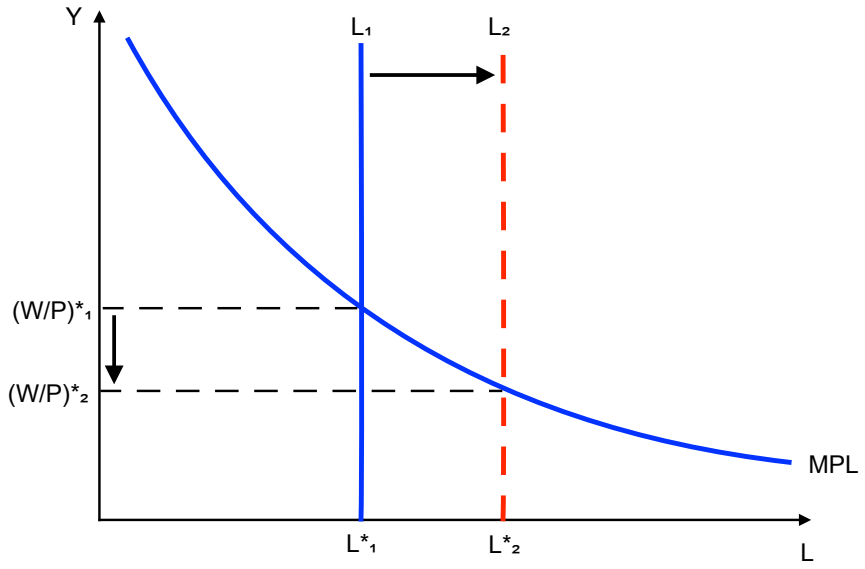
   d. **(3 points)** Does it imply constant factor shares?

   $$MPK = 2 \cdot 0.4 \cdot K^{-0.6} L^{0.6} = \frac{0.4 \cdot F(K, L)}{K} = \frac{0.4 \cdot Y}{K} \text{ and}$$
   $$MPL = 2 \cdot 0.6 \cdot K^{0.4} L^{-0.4} = \frac{0.6 \cdot F(K, L)}{L} = \frac{0.6 \cdot Y}{L}$$
   $$\Longrightarrow \bar{Y} = MPK \times \bar{K} + MPL \times \bar{L} = 0.4 \cdot \bar{Y} + 0.6 \cdot \bar{Y}$$

   Yes, it does imply constant factor shares.

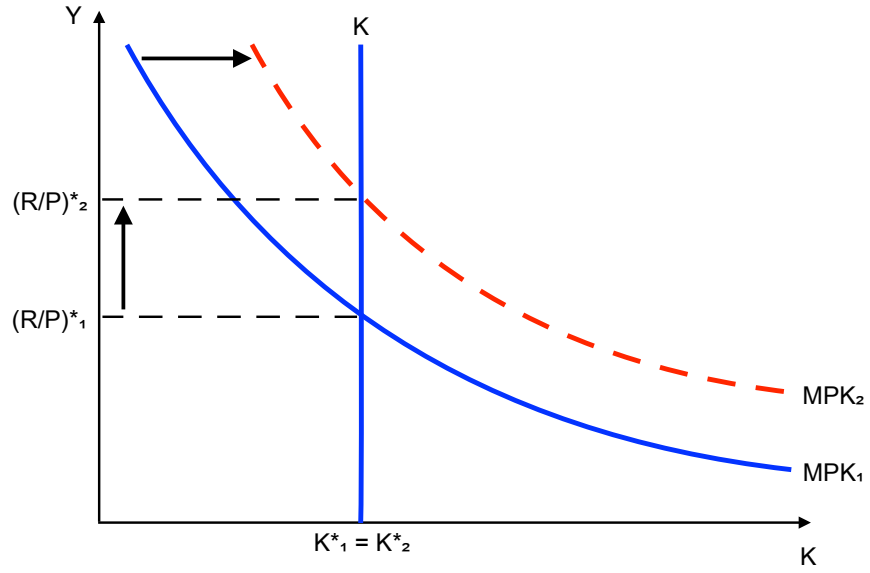
2. **(20 points)** The country of Prudencia is well-known for its fiscal restraint. Its factor markets are perfectly competitive and the economy's supplies of all factor inputs, as well as its production technology, are fixed. Furthermore, Prudencia does not trade with the outside world.

   a. **(4 points)** Using a diagram with labor on the horizontal and output on the vertical axis, show the equilibrium on the labor market. Then show what happens if labor supply increases.



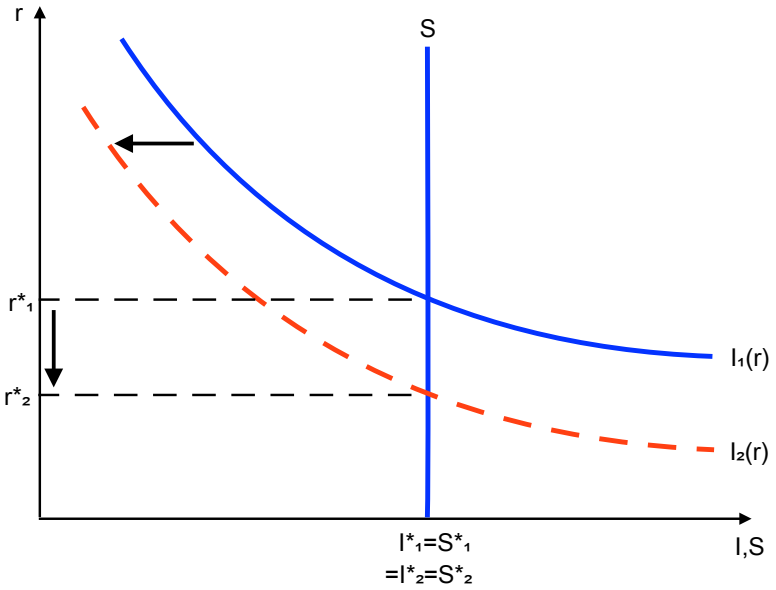
1 point for correct curves
1 point for correct shift in curves
1 point for labeling all 3 curves
1 point for axis titles and labels

   b. **(4 points)** Using a diagram with capital on the horizontal and output on the vertical axis, show the equilibrium on the capital market. Then show what happens if capital demand increases.



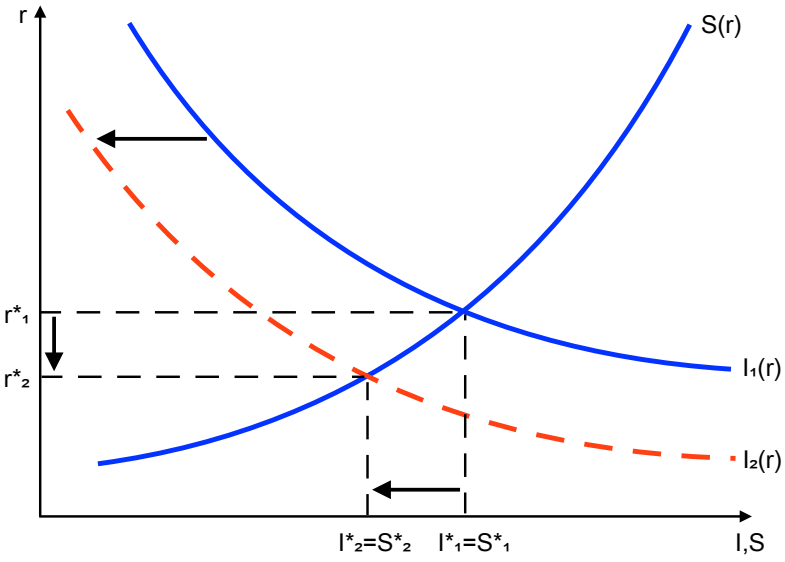
1 point for correct curves
1 point for correct shift in curves
1 point for labeling all 3 curves
1 point for axis titles and labels

c. (6 points) The newly elected government of Prudencia phases out an investment tax credit. In this new policy regime, firms are no longer able to reduce their tax liability by qualifying investments. Using a diagram for the loanable funds model with fixed savings, show the effects of this policy.



2 points for correct curves
2 points for correct shift in curves
1 point for labeling all 3 curves
1 point for axis titles and labels

d. (6 points) Now relax the assumption that savings are fixed, and show the effects on another diagram. If the initial equilibrium real interest rate *r** is the same as in part c., is the new *r** higher or lower than in the case of fixed savings?



1 point for correct curves
1 point for correct shift in curves
1 point for labeling all 3 curves
1 point for axis titles and labels
2 points for correct comparison of r* in parts c. vs. d.

The equilibrium real interest rate is higher here than in part c., because the savings curve is upward sloping instead of vertical.

3. **(10 points)** A long time ago in a galaxy far, far away, Tatooine was a desert planet in the Outer Rims. It fell under the influence of the Hutt Clan, who used a type of golden currency called wupiupi. Galactic historians have concluded that, in this far-away planet a long time ago, the quantity theory of money held.
   a. **(2 points)** What was the growth rate of velocity?

      One of the assumptions for QTM is that velocity is constant ($V = \overline{V}$). Therefore, its growth rate was zero.

   b. **(4 points)** One year, real output grew by 1 percent, the supply of wupiupis grew by 2 percent, and the nominal interest rate was 4 percent. What was the real interest rate?

      QTM: $$\pi = \frac{\Delta M}{M} - \frac{\Delta Y}{Y} = 2 - 1 = 1$$

      $$r = i - \pi = 4 - 1 = 3$$

      The real interest rate was 3 percent per year.

   c. **(4 points)** Archeological excavations in Mos Espa, the capital of Tatooine, uncover new artifacts from bars and clubs. Historians now theorize that the quantity theory of money did not hold after all: the Hutts were probably unable to mint new wupiupi coins quickly enough to keep up with the explosion of the bar scene, so they had to exchange wupiupis more rapidly. Assuming that the growth rate of velocity was 1 percent per year and all other macroeconomic variables grew at the same rate as in part b., how high was inflation?

      Quantity equation in growth rates:

      $$\frac{\Delta M}{M} + \frac{\Delta V}{V} = \frac{\Delta P}{P} + \frac{\Delta Y}{Y}$$

      $$2 + 1 = \frac{\Delta P}{P} + 1$$

      $$\Longrightarrow \pi = \frac{\Delta P}{P} = 2$$

      Inflation was 2 percent per year.