Economics 201 Fall 2006
Final Exam December 13, 2006

Name: **Solutions** **Box #:**

Instructions

1. This exam is to be taken in class. It is closed-book; no outside materials may be consulted. You may write your answers wherever you wish, but if any errors or ambiguities are discovered, they will be announced only in Eliot 314.

2. Answer the questions on the exam itself. If you need more space, use the back of the page. Answer each question concisely. None requires a long answer. Add a graph or equation if it clarifies your answer, but be sure to label axes and curves and to define variables that might be ambiguous.

3. You have until noon to finish the exam. If time seems scarce, use it where its marginal product is highest. Try to get at least a sentence or two written for every question before you elaborate at length on any single answer.

4. You are responsible for making sure that you understand each question clearly. In case of any ambiguity, be sure to consult the instructor in Vollum 229.

5. Please bring your exam to my office when you are finished.

Part A: Fill in the blank then provide a short (one- or two-sentence) explanation and/or graph to support your answer.

1. In the long run, a permanent, one-time increase in the money supply causes output to ***not change*** and prices to ***increase***.

Money is neutral in the long run because the LRAS is vertical.

2. Given the supply and demand curves in the credit market, an increase in the expected rate of inflation should ***increase*** the nominal interest rate and ***not change*** the real interest rate.

The demand and supply of credit depend on the real interest rate and are not affected by correctly anticipated inflation, so r does not change.

3. The short-run supply curve of a perfectly competitive firm is the portion of the ***marginal cost*** curve lying ***above*** the ***average variable cost*** curve.

Firms produce where P = MC, as long as they can cover their variable cost.

4. An improvement in technology that allows the same amount of output to be produced by half as many workers will ***increase (double)*** the marginal product of labor, ***increase (double)*** the marginal revenue product of labor, and ***increase*** a competitive firm's demand for labor.

The firm's labor demand curve is the MRP curve, so any increase in MRP is an increase in demand for labor. Of course, this enables the firm to increase its output.

5. If the demand for gizmos is elastic, then a decrease in the cost of producing gizmos leads to a(n) ***increase*** in overall consumer expenditures on them.

A decrease in cost will shift the supply curve out and down, lowering the equilibrium price. If demand is elastic, then quantity demanded will go up by more than the fall in price, so consumer expenditures increase.

6. According to the modern theory of the Phillips curve, if inflation is higher than ***expected*** then the unemployment rate is ***lower*** than ***the natural rate.***

Unemployment that is lower than the natural rate leads to higher than expected increases in nominal wages and prices.

7. If gammas are produced by a perfectly competitive industry with constant costs and U-shaped long-run average-cost curves, then the long-run effect of an increase in the market demand for gammas will be for price to ***not change,*** the output level of each gamma producer to ***not change,*** and the number of gamma producers to ***increase.***

After the change, each firm must once again be at the minimum point on its LAC curve. If the LAC is U-shaped, then there is a unique level of firm output at which this minimum occurs. Firms must all be at this (unchanged) level of output and price, so the additional demand will be satisfied by the entry of additional producers.

8. The characteristics of pure public good are ***nonrivalry*** and ***nonexcludability.***

This is the definition of a pure public good.

9. If bicycles and scooters are substitutes, then a decrease in the price of bicycles will ***decrease*** the demand for scooters, which will ***decrease*** their price.

From the definition of substitutes, demand for scooters will decline, which should lower their price.

10. The monetary base consists of ***currency*** held by the public plus banks' ***reserves***. The Fed changes its magnitude by ***open-market operations***.

This is the definition of the base.

11. A profit-maximizing monopoly produces ***less than*** the socially optimal amount. We know this because at its level of output, its ***marginal*** cost is ***less than*** price.

Monopolies equate marginal cost to marginal revenue, but MR < P.

12. If the market interest rate is 10%, then the present discounted value of a payment of $110 one year from today is $***100***. If the market interest rate decreases, the present value will ***increase***.

The present value formula says that PV = FV/(1 + i) = 110/1.10 = 100. A smaller denominator will increase PV.

13. According to the real-business-cycle model, output fluctuations are caused by ***supply shocks*** and the appropriate monetary policy in a recession is to ***do nothing.***

Because supply shocks do not usually cause Y to deviate from natural Y, aggregate-demand policy is not an appropriate response.

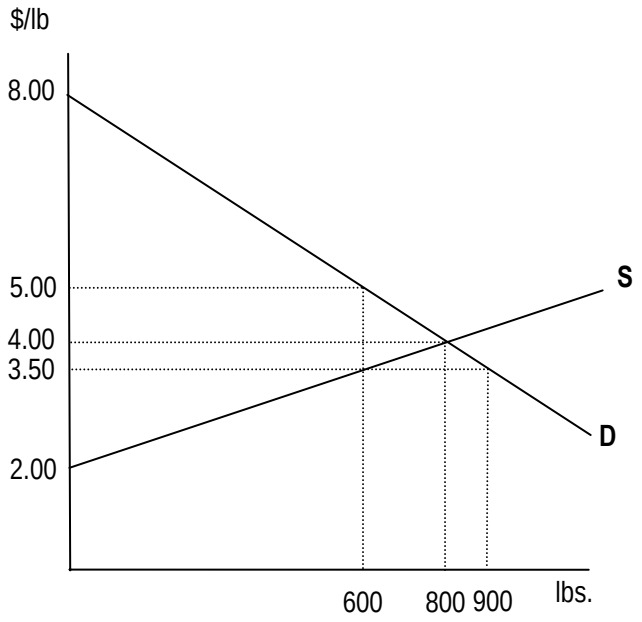
14. If Amanda's wage increases permanently, the substitution effect causes her to want to work ***more*** and the income effect causes her to want to work ***less***.

The substitution effect reflects the increased opportunity cost of leisure; the income effect results from the desire to enjoy some of the increased utility in the form of leisure.

Questions 15 through 17 refer to the perfectly competitive market for mooseberries shown below right.

15. If the market is allowed to clear, then consumer surplus is $***1600*** and producer surplus is $***800***.

Consumer surplus is the area of the triangle under the demand curve about $4.00. Producer surplus is area above supply curve below $4.00.



16. If the government places a $1.50/pound tax on mooseberries, then the deadweight loss will be $***150*** and the government's tax revenue will be $***900***.

The deadweight loss will be the area of the small triangle between the demand and supply curves from 600 to 800. Government revenue will be the area of the rectangle between $3.50 and $5.00 from 0 to 600.

17. If the government places a price ceiling of $3.50/pound on mooseberries, then the deadweight loss will be ***greater than or equal to*** the loss due to the $1.50/pound tax.

The loss will be the same if the highest-value consumers get the available 600 units. If not, then it will be larger.

Part B. Answer each of the following questions with a short essay.
18. Modern aggregate-supply theory asserts that firms will respond differently to a change in price resulting from an increase in aggregate demand depending on whether the change was anticipated or unanticipated. Use either the wage-contract model or the imperfect-information model to explain why the response to anticipated vs. unanticipated demand shocks would be different and how this difference leads to the conclusion that the SRAS curve slopes upward while the LRAS curve is vertical.

Wage contract: If change is anticipated, then higher nominal wage will be built into contracts and the real wage will not deviate from the equilibrium level, so output will be at natural level. If it is unanticipated, then nominal contract wage will be too low when prices rise and firms will increase employment and output in the short run in response to the reduced minimum wage. In the long run, the change in aggregate demand will be built into the new contracts and the real wage and employment return to equilibrium.

Imperfect information: If change is correctly anticipated, then everyone will recognize that costs (input prices) as well as (output) prices have changed and not change their output levels. If not anticipated, then they will think that there is some chance that relative demand for their products has changed and they will produce more, thinking that input prices may not have risen as much as output prices. In the long run, they will learn about input prices and realize that output prices and costs have increased by the same amount, leading them back to the natural level of output.

19. Suppose that the true natural rate of unemployment is 5% but that the central bank mistakenly believes that it is 4%. Use the modern theory of the Phillips curve to show what will happen over time if monetary policy attempts to keep the unemployment rate at 4%.

In the short run, they would push the economy up and to the left on the short-run Phillips curve to higher inflation and lower unemployment. Once this inflation becomes embodied in expectations, the Phillips curve will shift upward, returning the economy to the natural rate of unemployment at the

higher inflation rate. However, if the Fed persists, it will keep raising the inflation rate to try to lower unemployment, so inflation rises ever upward as long as this policy is attempted.

20. Consider the Solow growth model with a growing labor force ($n > 0$) but no technological change ($g = 0$).

a. What exactly is $sf(k)$?

Saving (investment) per worker.

b. What does $(n + \delta)k$ represent?

The amount of investment per worker that is required to replace depreciating capital and equip new workers.

c. Why is $\dot{k} = sf(k) - (n + \delta)k,$ and how is this expression useful in determining the steady-state properties of the model?

The difference between the magnitudes in parts a and b is the amount (if any, can be negative) of investment per worker that is left over after replacing depreciating capital and equipping new workers. This is the amount that each worker's capital stock increases. When this is positive (negative), capital per worker increases (decreases). When it is zero, capital per worker is stable and the economy has reached a steady-state equilibrium.

21. Elmo is a rational consumer. When buying apples and bananas in a competitive market, he chooses to buy 7 apples at \$1.50 each and 4 bananas at \$2.00 each. What, if anything, can we say about whether Elmo would have higher utility with each of the following commodity bundles than with his current one?

a. 8 apples and 4 bananas

Higher utility. He likes apples, so getting more apples and the same number of bananas increases utility.

b. 6 apples and 5 bananas

Uncertain. He could not have chosen this combination of apples and bananas without spending more, so we don't know if he would prefer it to 7 and 4.

c. 8 apples and 3 bananas

He would surely have lower utility with 8 and 3 because he could have chosen this without spending any more, but he chose 7 and 4 instead.

22. Evaluate the following statement: "Inflation should be procyclical if business cycles are caused by demand shocks and countercyclical is they are due to supply shocks."

This is true. Movements in the AD curve cause prices and output to change in the same direction; movements in AS cause them to move in opposite directions.

23. Use the IS/LM and AD/AS diagrams to show the effects of a tax increase on real output, prices, and the real interest rate in the short run and long run. Assume that the economy begins from full employment. Summarize your answers by entering +, −, or 0 in the empty cells of the table at lower right.

The IS and AD curves shift to the left, lowering output, real interest rates, and prices in the short run (assuming an upward-sloping SRAS). In the long run, prices decline sufficiently to move the LM curve down enough to restore IS/LM equilibrium at full employment. This is the point on the AD curve at full employment on the LRAS curve.

Variable	Short Run	Long Run
Real output	−	0
Real interest rate	−	−
Price level	− or 0	−

24. (Extra credit) Describe a widget. You are encouraged to include a diagram or drawing to illustrate your answer.

My favorite question to read!