

Name: \_\_\_\_\_ Date: \_\_\_\_\_

1. The basic aggregate supply equation implies that output exceeds natural output when the price level is:
  - A) low.
  - B) high.
  - C) less than the expected price level.
  - D) greater than the expected price level.
  
2. In industries *not* covered by formal wage contracts:
  - A) wages are always flexible.
  - B) wages are always fixed.
  - C) implicit agreements between workers and firms do not limit wage changes.
  - D) implicit agreements between workers and firms may limit wage changes.
  
3. According to the sticky-wage model, workers and employers make an explicit or implicit agreement that covers:
  - A) nominal wages.
  - B) real wages.
  - C) both nominal wages and quantity of employment.
  - D) both real wages and quantity of employment.
  
4. The imperfect-information model assumes that producers find it difficult to distinguish between changes in:
  - A) real wages and nominal wages.
  - B) the overall level of prices and relative prices.
  - C) the overall level of prices and the expected level of prices.
  - D) cost-push inflation and demand-pull inflation.
  
5. The sticky-wage model predicts that the real wage is \_\_\_\_\_ and data indicate that the real wage in the United States is \_\_\_\_\_.
  - A) procyclical; countercyclical
  - B) countercyclical; procyclical
  - C) procyclical; procyclical
  - D) countercyclical; countercyclical

6. The real wage is countercyclical if it \_\_\_\_\_ when output increases.
- A) increases
  - B) decreases
  - C) does not change
  - D) first increases, then decreases
7. Starting from the natural rate of output, an unexpected monetary contraction will cause output and the price level to \_\_\_\_\_ in the short run, and in the long run the expected price level will \_\_\_\_\_, causing the level of output to return to the natural rate.
- A) increase; increase
  - B) increase; decrease
  - C) decrease; decrease
  - D) decrease; increase
8. Along a short-run aggregate supply curve, output is related to unexpected movements in the \_\_\_\_\_. Along a Phillips curve, unemployment is related to unexpected movements in the \_\_\_\_\_.
- A) price level; inflation rate
  - B) inflation rate; price level
  - C) unemployment rate; price level
  - D) price level; level of output
9. The NAIRU is the:
- A) North American institutional rate of unemployment.
  - B) natural aggregate investment return on utilization.
  - C) non-accelerating inflation rate of unemployment.
  - D) normal American inelastic rate of unemployment.
10. Cost-push inflation is the result of:
- A) high aggregate demand.
  - B) low aggregate demand.
  - C) favorable supply shocks.
  - D) adverse supply shocks.
11. The tradeoff between inflation and unemployment does not exist in the long run because people will adjust their expectations so that expected inflation:
- A) exceeds the inflation rate.
  - B) equals the inflation rate.
  - C) is below the inflation rate.
  - D) equals the inflation rate of the previous year.

12. Assume that an economy's production function is  $Y = 1,000L^{1/2}$ , so that when the marginal product of capital is equated to the real wage the labor demand curve is  $L = 250,000(P/W)^2$ . The labor supply curve is  $L = 31,250(W/P)$ . The real wage that solves these equations is  $W/P = 2$ . Assume that the expected price level is 10, so that a nominal wage contract setting the wage at 20 is agreed to, making the expected real wage 2. If the price level turns out to be 10, 62,500 workers will be hired and output will be 250,000.
- If the actual price level turns out to be 20, what will the actual real wage be?
  - According to the labor demand curve, how much labor will be demanded if the actual real wage is at the level given in part a?
  - According to the production function, if the amount of labor given in part b is actually hired, how much will production be?
13. Assume that a firm has a production function  $Y = 1,000L^{1/2}$ , where  $Y$  is output and  $L$  is labor. Labor demand is  $L^d = 250,000(P/W)^2$  and labor supply is  $L^s = 31,250(W/P)$ . Initially, there is an equilibrium in which output is 250,000, employment is 62,500, the nominal wage is 20, and the price level is 10. Demand for output is 250,000 at the given price, so all output is sold. Suddenly, demand at the given price drops to 200,000, but the firm does not lower its price. It lowers output and lays off workers.
- Assuming that the firm cannot produce for inventory, how much will the firm want to produce?
  - Assuming output equals the amount given under part a, what employment force will the firms want to hire?
  - If the firm continues to pay the same nominal and real wage, how much more labor will workers wish to supply than the firm will want to hire?
14. Assume that an economy is governed by the Phillips curve  $\pi = \pi^e - 0.5(u - 0.06)$ , where  $\pi = (P - P_{-1})/P_{-1}$ ,  $\pi^e = (P^e - P_{-1})/P_{-1}$ , and 0.06 is the natural rate of unemployment. Further assume  $\pi^e = \pi_{-1}$ . Suppose that, in period zero,  $\pi = 0.03$  and  $\pi^e = 0.03$ --that is, that the economy is experiencing steady inflation at a 3-percent rate.
- Now assume that the government decides to impose whatever demand is necessary to cut unemployment to 0.04. Suppose the government follows this policy for periods 1 through 5. Create a table of  $\pi$  and  $\pi^e$  for these five periods.
  - Assume that, for periods 6 through 10, the government decides to hold unemployment at 0.06. Create another table of  $\pi$  and  $\pi^e$  for these five periods. Is there any reason to expect the inflation rate to go back to 0.03?
  - If the government persisted in its behavior under part a, do you think the public would continue for long forming expectations according to  $\pi^e = \pi_{-1}$ ? Why?

15. Assume that an economy operates according to the sticky-wage model. The nominal wage was set to make labor supply and labor demand equal when the expected price level equaled 120 (as measured by the consumer price index).
  - a. Use a graph of the labor market to illustrate what happens to the quantity of labor employed if the actual price level over the time period when wages are stuck equals 110.
  - b. Use a graph of the production function to illustrate how the quantity of output produced changes if the actual price level equals 110 when the expected price level is 120.
  - c. Given the unexpectedly low price level, will this economy be operating above, below, or at the natural rate?
  
16. Consider two economies: one operates according to the sticky-wage model and one operates under the sticky-price model. Aggregate demand unexpectedly falls in both countries, leading to a recession and an unexpected decline in price level and the demand for output.
  - a. Use a graph of the labor market in each country to illustrate the impact of the recession on the level of employment and the real wage.
  - b. In which country is the real wage procyclical? In which country is the real wage countercyclical?
  
17. Assume that an economy is initially operating at the natural rate of output. Use the model of aggregate demand and aggregate supply (using the upward-sloping short-run aggregate supply curve) to illustrate graphically the short-run and long-run effects on price and output of a reduction in government spending that produces a budget surplus.
  
18. Assume that an economy is initially at the natural rate of unemployment.
  - a. Use a Phillips curve diagram to illustrate graphically how the inflation rate and unemployment rate change both in the short run and in the long run to an unexpected expansionary monetary policy.
  - b. Use a Phillips curve diagram to illustrate graphically how the inflation rate and unemployment rate change both in the short run and in the long run to the announcement of a credible plan of expansionary monetary policy when people have rational expectations.

## Answer Key

1. D
2. D
3. A
4. B
5. B
6. B
7. C
8. A
9. C
10. D
11. B
12. a. 1 b. 250,000 c. 500,000
13. a. 200,000 b. 40,000 c. 22,500

14. a.

Period	$\pi^e$	$\pi$
1	0.03	0.04
2	0.04	0.05
3	0.05	0.06
4	0.06	0.07
5	0.07	0.08

b.

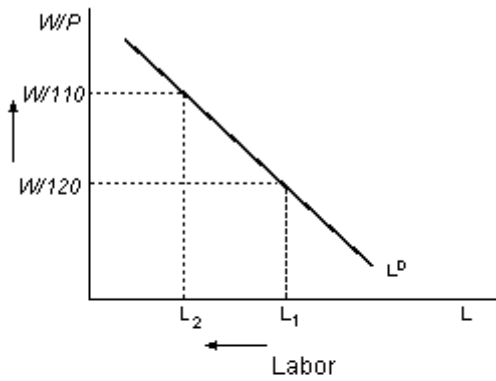
Period	$\pi^e$	$\pi$
6	0.08	0.08
7	0.08	0.08
8	0.08	0.08
9	0.08	0.08
10	0.08	0.08

There is no reason to expect inflation to fall as long as  $U = U^N$ .

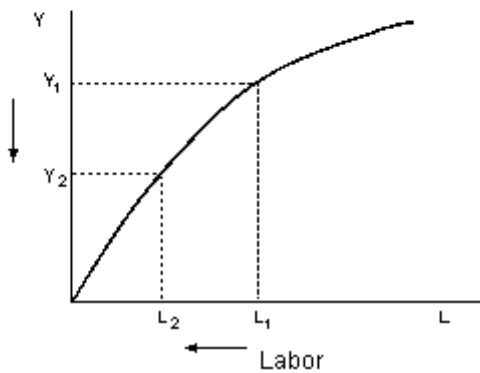
c. After a while, one would not expect the public to be fooled by steadily accelerating inflation.

15.

A)

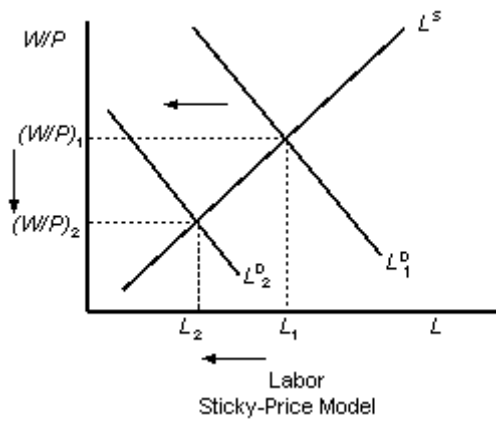
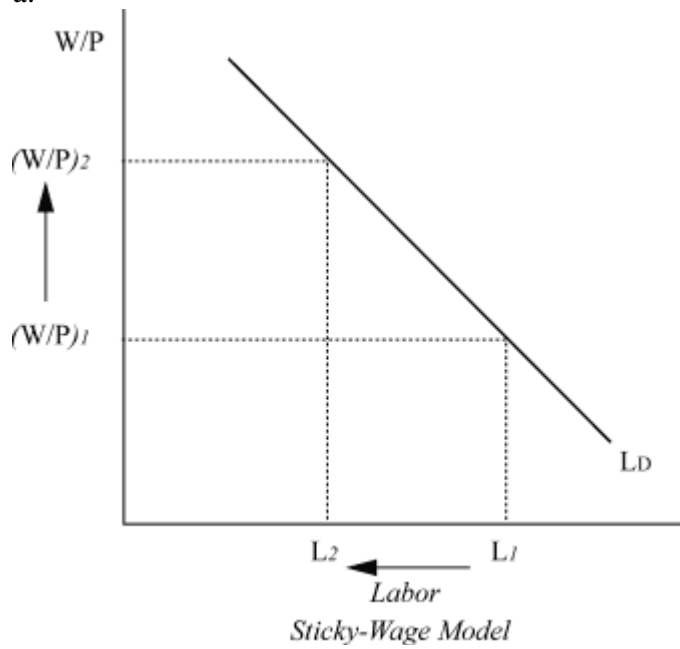


B)



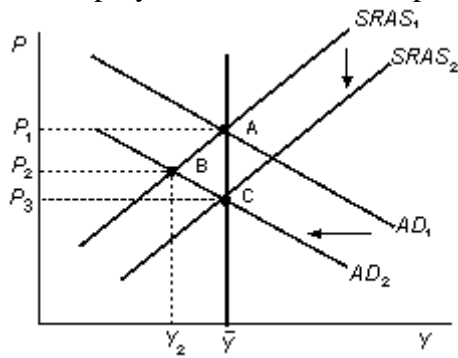
c. This economy will be operating at a level below the natural rate.

16. a.

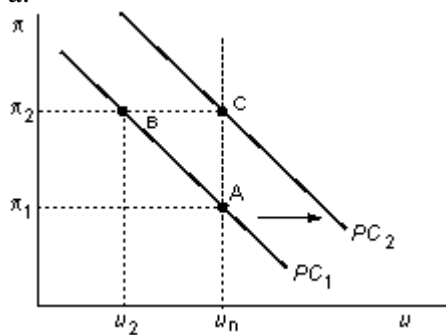


b. The real wage is procyclical (declines) in the country that follows the sticky-price model. The real wage is countercyclical (increases) in the country that follows the sticky-wage model.

17. In the short run output and prices decrease. In the long run output increases to restore full employment, but at a lower price level.

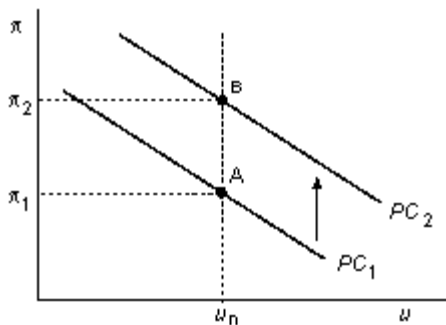


18. a.



In the short run the inflation rate increases to  $\pi_2$  and the unemployment falls to  $u_2$ . However, in the long run, the Phillips curve shifts upward to the right. The unemployment rate returns to the natural rate, but with a higher rate of inflation than what it was initially. There is a short run tradeoff between inflation and unemployment.

- b.



Since expectations are formed rationally and the policy is credible, the Phillips curve will immediately shift upward to the right. In both the short run and the long run, the inflation rate increases to  $\pi_2$ , but the unemployment rate remains at  $u_n$ . There is no short-run tradeoff between inflation and unemployment in the short run or in the long run.