and workers may view layoffs as a more credible signal that the firm is really in trouble than a claim by management that wages must be cut for the good of the firm. Risk aversion by workers may mean that they prefer a constant income stream with greater risk of layoffs to the variable income stream that would result from nominal wage cuts. Additionally, workers who care about status may prefer unemployment for some period to accepting a job at a low-wage firm, and thus there may not be downward pressure on wages.

Firms pay a payroll tax in order to finance unemployment insurance, and the tax payment is based on the worker’s income, the state the firm is in, the industry the firm is in, and the firm’s layoff experience. One reason employers may prefer temporary layoffs to wage reductions is the imperfect experience rating of the unemployment insurance (UI) payroll tax. Firms with a history of frequent layoffs would be expected to have to offer workers a compensating wage differential to equate their expected earnings with those from lower paying jobs that do not have frequent spells of unemployment. The availability of unemployment benefits helps fill this gap, reducing the necessary compensating differential. With imperfect experience rating—most notably, maximum tax rates—the unemployment taxes paid by employers who frequently lay off workers will be inadequate to cover benefit claims of their employees. In effect, these employers (and indirectly, their employees) are subsidized by those employers with less frequent layoffs. Therefore, the structure of the UI tax system enhances the attractiveness of layoffs and should be expected to increase the proportion of people flowing from e to u over any given period, thus increasing the unemployment rate.

Unemployment resulting from a demand decrease and downwardly rigid real wages is often categorized as seasonal unemployment if the decrease in demand follows a systematic and predictable pattern over the course of a year. If these periods of unemployment cause workers to consume more leisure than desired, Appendix 8A showed that firms using predictable but excessive temporary layoffs would have to pay a compensating differential to attract workers. Again, the size of those differentials is muted by the availability of unemployment insurance benefits. The existence of such differentials makes seasonal unemployment difficult to evaluate from a normative perspective since one could argue that it is the result of voluntary choice.

The level of unemployment that tends to prevail in “normal” times is called the full-employment or natural rate of unemployment. The full-employment rate refers to the rate of unemployment associated with zero excess demand for labor. The full-employment rate was considered to be in the 5.5% to 6% range until fairly recently. But recent experience with unemployment consistently below 5% and no significant inflation is causing economists to reconsider what the natural rate might be. Reasons for changes in the natural rate include demographic shifts, such as the number of teenagers in the work force, as well as institutional factors.

Unemployment rates above the full-employment rate lead to significant reductions in national output. One estimate, generally known as Okun’s Law, states that every one percentage point decline in the aggregate unemployment rate is associated with a 3 percentage point increase in the output of the United States. More recent estimates suggest that a 2 percentage point increase in output is more accurate, but regardless, it is clear that unemployment results in a large cost due to forgone output.

### Review Questions
Choose the letter that represents the **BEST** response.

**The Measurement of Unemployment**

1. If the number of unemployed workers equals 15 and the number of employed workers equals 135, the unemployment rate equals
   a. 10%.
   b. 11.1%.
   c. 12.5%
   d. 15%.
2. Which of the following is a reason that the unemployment rate may overstate the degree of economic hardship?
   a. The employment rate can be rising at the same time the unemployment rate is rising.
   b. The number of people classified as unemployed includes those not actively seeking work.
   c. Job seekers may become discouraged and drop out of the labor force.
   d. Both a and b.

A Stock-Flow Model of the Labor Market

3. If the labor market flow $P_{ue}$ is found to equal 0.2 for a particular month, this means that
   a. 20\% of the total adult population flowed from unemployment to employment during the month.
   b. 20\% of the total labor force flowed from unemployment to employment during the month.
   c. 20\% of those who were initially unemployed became employed during the month.
   d. 20\% of those who were initially employed became unemployed during the month.

4. Holding all else constant, which of the following labor market flows would increase the unemployment rate if it increased?
   a. $P_{en}$
   b. $P_{ue}$
   c. $P_{ue}$
   d. All of the above

Types of Unemployment

5. The level of frictional unemployment is determined by
   a. the flows of people into and out of employment.
   b. the duration of the spells of unemployment.
   c. the level of excess demand.
   d. both a and b.

6. Which of the following factors would tend to increase a person’s reservation wage?
   a. An increase in the cost of job search
   b. An increase in the replacement rate of unemployment insurance benefits
   c. The imperfect experience rating of unemployment insurance
   d. A decrease in the person’s skill level

7. Which of the following is an effect associated with a higher reservation wage?
   a. Decreased duration of unemployment
   b. Higher post-unemployment wages
   c. More underemployment
   d. All of the above

8. Structural unemployment is caused by
   a. changing patterns of labor demand.
   b. real wages being inflexible downward.
   c. high costs of occupational and/or geographic adjustment.
   d. all of the above.
9. A government policy likely to be helpful in dealing with structural unemployment is
   a. a requirement that firms give employees advance notice of plant closings.
   b. a minimum wage law.
   c. an increase in unemployment insurance.
   d. the creation of public sector jobs.

10. The payment of efficiency wages may result in higher rates of unemployment because
    a. firms will lay off workers once productivity increases.
    b. quit rates tend to be higher at firms paying efficiency wages since workers must work harder than at other firms.
    c. employees at low-wage firms may decide that expected earnings can be increased by searching for employment among employers paying efficiency wages.
    d. firms that pay efficiency wages work their existing workers longer hours.

11. The empirical relationship known as “the wage curve” says that
    a. high rates of unemployment tend to be associated with higher wages.
    b. high rates of unemployment tend to be associated with lower wages.
    c. high rates of unemployment tend to be associated with falling wages.
    d. high rates of unemployment tend to be associated with low rates of inflation.

12. A likely explanation for the empirical finding known as “the wage curve” is that
    a. wages are inflexible downward.
    b. a surplus of labor causes the wage to fall.
    c. employers do not feel as much of a need to pay an efficiency wage when the unemployment rate is high.
    d. higher reservation wages lead to higher levels of frictional unemployment.

13. Demand deficient unemployment results from
    a. a general slowdown in business activity.
    b. real wages being inflexible downward.
    c. changes in the skills required of workers.
    d. both a and b.

14. A social norm against undercutting the prevailing wage may develop because
    a. workers are concerned about the future level of wages.
    b. unions are likely to strike if wages fall too low.
    c. unemployment insurance exists to protect unemployed workers.
    d. worker mobility is not perfect.

15. The method of financing unemployment insurance benefits tends to
    a. increase the length of job search.
    b. increase frictional unemployment.
    c. create an incentive for firms to prefer layoffs to wage cuts.
    d. both a and b.
16. Under an unemployment insurance system that uses no experience rating, the cost to a firm in increased unemployment insurance taxes of laying off a worker would
   a. equal zero.
   b. equal the unemployment insurance benefits paid to the worker.
   c. equal approximately 50% of the benefits paid to the worker.
   d. equal approximately 50% of the worker’s previous earnings.

17. Seasonal unemployment can be considered voluntary unemployment because
   a. it is caused by wages being inflexible downward.
   b. to attract workers to industries with well-known seasonal fluctuations in demand, employers may have to pay workers a compensating differential.
   c. workers are covered by unemployment insurance.
   d. all of the above.

When Do We Have “Full-Employment”? 

18. Which of the following is not a commonly used definition of the full-employment (natural) rate of unemployment?
   a. The unemployment rate that prevails in normal times
   b. The unemployment rate where the number of job vacancies equals the number of new labor force entrants
   c. The unemployment rate associated with zero excess demand for labor
   d. The unemployment rate at which all unemployment is voluntary

19. Over the last fifteen years the full-employment rate of employment seems to be moving downward. Which of the following changes are consistent with this movement?
   a. A decrease in the share of teenagers in the labor force
   b. A decrease in the share of blacks in the labor force
   c. An increase in the share of women in the labor force
   d. All of the above

20. Recent estimates suggest that every one percentage point decrease in the unemployment rate raises national output by
   a. 2 percentage points.
   b. 3 percentage points.
   c. 5 percentage points.
   d. 10 percentage points.

Problems

The Measurement of Unemployment

21. Suppose that the population aged 16 or over in a particular area could be categorized as follows
   Not in the labor force = 150,
   Employed = 230,
   Looking for work = 15,
   Waiting to be recalled from a layoff = 5.
21a. Compute the unemployment rate.

21b. Compute the labor force participation rate.

21c. Compute the employment rate.

21d. If the unemployment rate rises 2 percentage points above its initial level, how much would the labor force participation rate have to increase to keep the employment rate constant?

Types of Unemployment

22. Consider a labor market with two sectors denoted by A and B. The demand and supply curves for labor in sector A are given by the equations

\[ \text{Demand: } L_A^D = 20 - W, \]
\[ \text{Supply: } L_A^S = W. \]

The demand and supply curves in sector B are given by the equations

\[ \text{Demand: } L_B^D = 40 - 2W, \]
\[ \text{Supply: } L_B^S = 2W. \]

22a. Find the market-clearing wage and employment level in each sector.

22b. Is it likely that the unemployment rate will be zero at the market-clearing value of the wage? If not, how would you categorize this unemployment?

22c. Suppose that the demand for the product produced in sector B increases at the expense of the product in sector A. As a result the demand for labor in sector A becomes

\[ L_A^D = 15 - W, \]

while the demand in sector B becomes

\[ L_B^D = 45 - 2W. \]

If \( W \) denotes the real wage, and the real wage in sector A is inflexible downward, how many workers will be unemployed in sector A? What will happen to the real wage and employment level in sector B?

22d. What adjustment in the supply of workers in each sector would eliminate the unemployment in sector A? How would this affect wages and employment in sector B?

22e. What factors tend to inhibit these adjustments?

22f. Assuming the necessary adjustments cannot be made, how would you classify this type of unemployment?
A Model of Job Search

23. Consider a labor market where employers differ in the level of skill \((K)\) that they require, where \(K\) ranges from 1 to 6. Each employer then pays a wage equal to the skill level of the job multiplied by 10. Assuming for simplicity that there is an equal proportion of employers at every wage level, the distribution of wage offers can be represented by the uniform distribution

\[ f(W) = 0.02. \]

Now consider an unemployed individual with a skill level of \(K^* = 5\). Assuming that the person does not know the skill level associated with any particular employer, suppose that he or she searches randomly over all the firms in this labor market.

23a. Assuming the worker will accept any job that is offered, what is the probability that a job offer will be forthcoming at any particular employer?

23b. Now suppose that the worker plans to use a reservation wage strategy. What is the probability of the worker getting a better offer than the reservation wage?

23c. What is the wage gain that can be expected from such an offer?

23d. What is the expected gain from additional job search under the reservation wage strategy?

23e. Assuming for simplicity that the marginal cost of an additional period of job search is $1, what is the optimal value of the reservation wage?

23f. What is the probability of a job offer given the reservation wage strategy?

23g. Using the stock flow model of the labor market, explain how the use of a reservation wage strategy impacts the unemployment rate.

Applications

The Effects of a Government Training Program on Job Search

24. Consider the distribution of wages used in the Summary section Example problem. Suppose that a government-sponsored training program has increased the person’s skill level to \(K^* = 3\).

24a. Assuming the worker will accept any job that is offered, what is the probability that a job offer will be forthcoming at any particular employer?

24b. Now suppose that the worker plans to use a reservation wage strategy. What is the probability of the worker getting a better offer than the reservation wage?

24c. What is the wage gain that can be expected from such an offer?

24d. What is the expected gain from additional job search under the reservation wage strategy?