7 [22]

Unemployment, Inflation, and Long-Run Growth

Chapter objectives:

1. Define the labor force and the unemployment rate and give the official definition of employment. Describe the limitations of the unemployment rate statistic, outlining the effects of "discouraged workers" on official unemployment statistics.
2. Distinguish among, and give examples of, frictional, structural, and cyclical unemployment. Define the natural rate of unemployment and describe the economic and social costs of unemployment.
3. Define inflation. Outline the problems of price indexes such as the Consumer Price Index.
4. Indicate who gains and who loses from inflation. Distinguish between anticipated and unanticipated inflation and indicate how their impacts on the economy differ. Describe the concept of the real interest rate and outline the effect of anticipated inflation on it.
5. Detail the factors influencing output growth.

This chapter concludes the sequence of three largely definitional chapters, looking at two short-run concepts (unemployment and inflation) and two long-run concepts (output growth and productivity growth). A working knowledge of these concepts is essential when you study policy formulation in subsequent chapters.

BRAIN TEASER: Probably, you don't habitually play your car audio at maximum volume—there's an ideal level that holds some additional capacity in reserve. The same principle is true for the economy. A normally functioning economy has some excess capacity and some rate of unemployment. This rate of unemployment is the natural rate of unemployment. In 1950, this natural rate was estimated to be 4%. Since then, the natural rate of unemployment has risen, with the President's Council of Economic Advisers placing it at 6.5% in 1986. The expectation was that it would continue to increase. Why did the natural rate of unemployment increase in the latter part of the twentieth century? Is it still increasing?

OBJECTIVE 1:
Define the labor force and the unemployment rate and give the official definition of employment. Describe the limitations of the unemployment rate statistic, outlining the effects of "discouraged workers" on official unemployment statistics.

The *labor force* totals the employed and unemployed. The *employed* include any person 16 years of age or older who:

a. works one hour or more per week for pay, or
b. works fifteen or more hours a week without pay in a family enterprise, or
c. has a job but is temporarily absent from work, with or without pay.

The *unemployed* person must be available and looking for work during the previous four weeks. Otherwise, s/he is considered to be out of the labor force. Some workers, *discouraged* by their inability to find jobs, stop looking for work and drop out of the labor force. (page 123 [435])

The *unemployment rate* is the ratio of unemployed persons (who have no job and are actively seeking employment) to the labor force. An analysis of unemployment reveals large ethnic, gender, and regional differences in unemployment rates. (page 124 [436])

LEARNING TIP: Remember that to be officially "unemployed," a member of the labor force must not have a job or recently have had a job, and must be looking actively for work. Behind this distinction is the concept of the "discouraged" worker. Memorize the definitions of unemployment rate, participation rate, inflation, and the three types of unemployment and their causes.

Practice

The population of Arbez is 150,000, of which 100,000 are aged 16 or older. Of this 100,000, 60,000 have jobs and 40,000 do not. 20,000 are unemployed but actively seeking jobs, and there are 20,000 who have given up the job search in frustration.

1. What is the unemployment rate? _____

   ANSWER: The unemployment rate is 25%; the labor-force participation rate is 80%. Of the 150,000 Arbezanis, only 100,000 are of an age that qualifies them to be in the labor force. Of the 100,000, 60,000 are employed, and an additional 20,000 are unemployed (without jobs, seeking work). The remaining 20,000 discouraged workers have dropped out of the labor force. There are, then, 80,000 workers in the labor force. Unemployment rate = unemployed/labor force = 20,000/80,000 = 25%.

2. What is the labor-force participation rate? _____

   ANSWER: Labor-force participation rate = labor force/population (over 16) = 80,000/100,000 = 80%.

3. During a recession, we expect to see output _____ and unemployment _____ .
   (a) increasing; increasing
   (b) increasing; decreasing
   (c) decreasing; increasing
   (d) decreasing; decreasing

   ANSWER: (c) By definition, a recession occurs when real GDP falls for two or more quarters. As output falls, more workers are laid off. Refer to p. 125 [437].

4. Typically, workers in a fishing-gutting factory have a high rate of absenteeism. Phyllis the Filleter has been "off sick" this week. She is correctly classified as
   (a) employed.
   (b) unemployed.
   (c) a discouraged worker.
   (d) not in the labor force.

   ANSWER: (a) If Phyllis is temporarily absent, with or without pay, she is considered employed. Refer to p. 124 [436].

5. The labor force is comprised of
   (a) the employed plus the unemployed.
   (b) the employed minus the unemployed.
   (c) the employed, the unemployed, and discouraged workers who could work.
   (d) the employed plus the unemployed minus discouraged workers who could work.

   ANSWER: (a) Discouraged workers are not counted as part of the labor force.

6. In Arbez, there are 80,000 persons in the labor force, and the unemployment rate is 25%. As the economy moves out of a long recession and job openings increase, 5,000 discouraged workers become "encouraged" and begin searching for a job. The unemployment rate will become
   (a) 18.75%.
   (b) 23.5294%.
   (c) 29.4118%.
   (d) 31.25%.

   ANSWER: (c) Initial unemployment rate = 25% = unemployed/80,000. The number unemployed is 20,000. When 5,000 new (unemployed) workers enter the labor force, the unemployment rate = 25,000/85,000 = 29.4118%.

7. The nation of Regit has a population of 1 million citizens. The labor-force participation rate is 80%. The number of Regitanis with jobs is 728,000. The unemployment rate is
   (a) 7.20%.
   (b) 8.00%.
   (c) 9.00%.
   (d) 9.89%.

   ANSWER: (c) The unemployment rate = unemployed ÷ labor force = 72,000/800,000 = 0.09.
   Labor force = participation rate × population = 0.8 × 1,000,000 = 800,000.
   Unemployed = 800,000 – 728,000 = 72,000.

8. The nation of Noil has a population of 1 million citizens. The labor-force participation rate is 80%. 50,000 persons are unemployed in March. By June, 10,000 persons have given up seeking employment. This is the only change over the quarter. We can conclude that the unemployment rate was
   (a) 6.25% in March and 7.50% in June.
   (b) 6.25% in March and 6.25% in June.
   (c) 6.25% in March and 5.06% in June.
   (d) 5.00% in March and 6.25% in June.

   ANSWER: (c) In March, the unemployment rate = unemployed ÷ labor force = 50,000/800,000 = 0.0625. In June, the unemployment rate = unemployed ÷ labor force = 40,000/790,000 = 0.05063, or 5.06%. ■

OBJECTIVE 2:
Distinguish among, and give examples of, frictional, structural, and cyclical unemployment. Define the natural rate of unemployment and describe the economic and social costs of unemployment.

The three types of unemployment are:

- *Frictional*—short-run unemployment due to the movement of individuals between jobs, while seeking a better match for their skills.
- *Structural*—longer-term unemployment, caused by changing tastes or changing technology that make some job skills less desirable. Automation or change in public preferences (foreign cars instead of U.S. cars) might cause structural unemployment.
- *Cyclical*—caused by recessions and depressions. (page 129 [441])

The first two types of unemployment are inevitable in a healthy, dynamic economy. Together, they comprise the rather imprecise concept of the *natural rate of unemployment*—the rate of unemployment that occurs during the normal operation of the economy. Full employment doesn't imply zero percent unemployment. (page 129 [441])

Recessions and cyclical unemployment result in lost output and adverse social consequences (broken homes, alcoholism, and suicide), and lower investment and economic growth. (page 129 [441])

◗◗◗ LEARNING TIP: Think of **full employment** as being 100% employment minus the natural rate of unemployment. The economy may have a lower or higher rate of employment than 94 to 96%, but such a divergence will be *temporary*. Note that, even when unemployment is greater than zero, society can still be at a point on (not inside) its production possibilities frontier.◖

ECONOMICS IN PRACTICE: On page 127 [439], the textbook looks at the increasing role of women in the labor market, with the female labor force participation rate expanding from 36% in 1955 to 60% in 1996. The male rate declined from 85% to 75% during the same time period. What might have caused the male participation rate to decrease? Also, by examining Table 7.2 (22.2), we can see that female unemployment rates are consistently lower than the rates for comparable males. Can you suggest why?
ANSWER: The male labor force participation rate may have decreased as married couples swapped roles, with more men staying home as women went out to work. This is, at best, a partial explanation because participation rates for single males have also declined. Many non-participating single males live with parents or others who provide support for them. In addition, a growing number of males receive disability payments.
Unemployment rates for females may be lower than those for males because female workers are "better" in some way—more reliable, quicker to learn, or willing to accept lower wages. An alternative (but not mutually exclusive) explanation is that some females remain in the role of the secondary wage-earner. If this type of marginal worker loses her job she may be more likely to become "discouraged," drop out of the labor force, and no longer be counted as unemployed.

Practice

9. Unemployment caused by short-run job/skill matching problems is
   (a) frictional unemployment.
   (b) structural unemployment.
   (c) cyclical unemployment.
   (d) natural unemployment.

   ANSWER: (a) Refer to p. 129 [441] for the definition of frictional unemployment.

10. Recessions have all of the following beneficial effects EXCEPT
   (a) inflation is reduced.
   (b) efficiency is improved.
   (c) the crime rate is decreased.
   (d) the balance of payments improves because imports decrease.

   ANSWER: (c) Typically, the crime rate rises during a recession.

11. During the Great Depression of the 1930s, many laborers found great difficulty finding a job. They were
   (a) frictionally unemployed.
   (b) structurally unemployed.
   (c) cyclically unemployed.
   (d) discouraged workers.

   ANSWER: (c) In the 1930s, demand was low throughout the economy.

12. The unemployment rate that occurs as a normal consequence of the efficient functioning of the economy is the
   (a) frictional rate of unemployment.
   (b) structural rate of unemployment.
   (c) cyclical rate of unemployment.
   (d) natural rate of unemployment.

   ANSWER: (d) Refer to p. 129 [441]. This rate includes both frictional and structural unemployment.

13. For many years, Noil was a traditional agrarian economy, specializing in rice production. In the past few years, however, due to loans from the World Bank, Noil has developed a thriving industrial sector, and farming (although increasingly mechanized) has declined. We would conclude that, over the past few years, frictional unemployment has _____ and structural unemployment has _____ .
    (a) increased; increased
    (b) increased; decreased
    (c) decreased; increased
    (d) decreased; decreased

    ANSWER: (a) As the economy's structure is changing, new skills are being required and old skills are becoming obsolete—structural unemployment is increasing. As skills become more specific and more complex, the search time to find a suitable job increases—frictional unemployment increases. ■

OBJECTIVE 3:
Define inflation. Outline the problems of price indexes such as the Consumer Price Index.

Inflation is a rise in the overall price level. It can be measured by a price index (such as the Consumer Price Index). The CPI and most other price indexes are based on a typical "basket" of commodities and measure how the price of the basket changes over time. Clearly, the effectiveness of a fixed-weight price index like the CPI depends on how well its basket of commodities reflects the economy as time passes and prices change. Research has suggested that the CPI overstates the increases in the cost of living. The Chained Consumer Price Index, which uses charging weights, attempts to correct for the bias introduced as consumers shift away from high-priced goods. (page 130 [442])

◗◗◗ LEARNING TIP: The Consumer Price Index has a base year that is assigned an index value of 100. Use the following formula to calculate the price index for a given year:

$$\frac{\text{price of bundle in given year}}{\text{price of bundle in base year}} \times 100 = \text{price index}$$

In the base year itself, the index is 1.00×100, or 100. An index of more than (less than) 100 in a given year indicates that prices are more than (less than) those in the base year.

◗◗◗ LEARNING TIP: Be careful! If the CPI rises from 120 to 132, the rate of inflation is *not* 12%, but 10% [(132 – 120)/120]. Don't just subtract one value from the other—be sure to divide by the value of the first year's price index.◖

Practice

14. If the CPI is 120 in Year 1 and 135 in Year 2, what is the percentage change in the price level from Year 1 to Year 2?
    (a) 12.5%
    (b) 15%
    (c) 20%
    (d) 35%

    ANSWER: (a) The price index changes by 15 relative to the initial price level of 120 so (15/120) $\times$ 100 = 12.5%. ■

OBJECTIVE 4:
Indicate who gains and who loses from inflation. Distinguish between anticipated and unanticipated inflation and indicate how their impacts on the economy differ. Describe the concept of the real interest rate and outline the effect of anticipated inflation on it.

Costs of inflation are difficult to measure. Inefficiencies occur, and administrative costs increase. Also, capital investment may decrease, affecting the economy's long-term growth rate. Losers include those on fixed incomes and lenders (creditors), whereas winners include borrowers (debtors). Indexation, adjustable rate mortgages, and cost of living adjustments (COLAs) reduce the impact of inflation—in fact, such corrective devices were introduced specifically because inflation had been causing adverse redistributional effects. Unanticipated inflation is more troublesome than anticipated inflation when we consider the distribution of income. By definition, if inflation is anticipated, its presence can be incorporated into contracts and agreements. Unanticipated inflation, on the other hand, is a surprise that will injure some and benefit others. Lenders, for instance, tend to lose when inflation is unexpectedly high. (page 132 [444])

LEARNING TIP: Common sense should help you work out who wins and who loses during inflation; if it doesn't, memorize this part of the chapter! Note that the difference between the market interest rate and the real interest rate is defined in the textbook as the inflation rate, but the associated example refers to the anticipated inflation rate. The market interest rate is determined by the anticipated inflation rate.

LEARNING TIP: Despite some "menu costs" (the costs of changing price tags, printing new catalogs, etc.), **fully anticipated** inflation is not much of a problem. Rational economic behavior can continue. However, when the rate of inflation is variable and unpredictable, persons run the risk of making "bad" deals and try to compensate by overestimating wage claims and price increases. Adding this safety margin fuels the fires of inflation.

Practice

15. Inflation is expected to run at 10% this year. Instead, it slows to 3%. This change will hurt
    (a) creditors.
    (b) debtors.
    (c) creditors and debtors equally, because it's the same for both parties.
    (d) neither, because inflation is lower.

    ANSWER: (b) If inflation is higher than expected, creditors lose because they will fail to compensate themselves through a higher interest rate. When inflation is lower than expected, debtors lose because they are paying an interest rate that is "too high."

16. Inflation is expected to run at 10% this year. Instead, it slows to 3%. This year, there has been
    (a) an anticipated deflation.
    (b) an unanticipated deflation.
    (c) an anticipated reduction in inflation.
    (d) an unanticipated reduction in inflation.

    ANSWER: (d) The change was not expected. This is not a deflation—the price level is still rising at 3% a year. A deflation occurs when the price level (not the rate of increase in the price level) falls.

17. Inflation is expected to run at 10% this year. The real interest rate is 4%. This year, the market interest rate is _____ . If, during the year, the actual inflation rate is 4%, _____ lose.
    (a) 6%; lenders
    (b) 6%; borrowers

(c) 14%; lenders
(d) 14%; borrowers

ANSWER: (d) The interest rate = inflation rate + real interest rate = 10% + 4% = 14%. Unanticipated deflation hurts borrowers.

18. Which of the following statements is false?
(a) When interest rates are high, the opportunity cost of holding cash is high.
(b) The more difficult it becomes to predict the rate of inflation, the more the level of investment decreases.
(c) Individuals on fixed incomes gain during periods of deflation.
(d) In the mid-1970s, prices were lower than in the 1990s, and, therefore, inflation was lower too.

ANSWER: (d) Historically, Option (d) is false; inflation rates were higher in the mid-1970s than in the 1990s. Refer to Table 7.5 (22.5) in the textbook. Option (d) is false theoretically, too. The fact that the price level is low doesn't imply that the rate of increase will also be low.

19. The difference between the interest rate a bank charges on a loan and the inflation rate is
(a) the profit margin.
(b) the real interest rate.
(c) the anticipation markup.
(d) the nominal interest rate.

ANSWER: (b) Refer to p. 133 [445] for this definition. ■

OBJECTIVE 5:
Detail the factors influencing output growth.

Output requires inputs. The two major inputs are capital and labor. The nation's rate of growth depends on the rate of increase in the quantity of capital and labor and on improvements in the productivity of these resources. Positive net investment increases the stock of capital whereas the labor force can be increased by either an increase in population or the labor-force participation rate. The productivity of a resource can be increased by providing a greater quantity and quality of complementary resources—labor productivity will increase if workers have better machines. In addition, the productivity of a resource will rise through greater efficiency and, in the case of labor, through improvements in human capital. (page 134 [446])

Practice

20. Output growth depends on each of the following EXCEPT
(a) positive net investment.
(b) an increasing consumer price index.
(c) the growth rate of human capital per worker.
(d) an increase in the labor-force participation rate.

ANSWER: (b) Refer to p. 134 [446]. Output depends on availability and usage of resources.

21. Each of the following will increase labor productivity EXCEPT
(a) an increase in the amount of capital being used.

(b) an increase in the efficiency of the capital being used.
(c) an increase in human capital.
(d) an increase in the number of workers.

ANSWER: (d) Labor productivity is output per worker hour. If we increase the number of workers, total output should increase, but there is no guarantee that average output will increase. ■

BRAIN TEASER SOLUTION: Demographic changes, government policy, and structural change have affected the natural rate of unemployment. As the 1950s turned into the 1960s and 1970s, greater numbers of teenagers, minorities, and women entered the labor market. These groups typically face poorer employment opportunities. Unemployment insurance reduced the pressure to get another job immediately—workers waited longer to find the "right" job. Two income families similarly reduced the need for the "breadwinner" to be employed. In addition, the increasing pace of technological change reduced the likelihood that an employee would stay with the same firm, or even in the same industry, throughout his working life. New job skills would need to be learned.
By the end of the century the trend had reversed somewhat. The baby-boomers (still a large fraction of the labor market) are embedded in stable jobs, looking toward retirement.

PRACTICE TEST

I. MULTIPLE-CHOICE QUESTIONS

Select the option that provides the single best answer.

_____ 1. A newly qualified dental school graduate, Phil McCafferty, is looking for a place to set up practice. He is _____ unemployed.
(a) frictionally
(b) structurally
(c) cyclically
(d) residually

_____ 2. The unemployment rate will fall if
(a) there is an increase in the number of discouraged workers.
(b) there is a recession.
(c) the number in the labor force decreases.
(d) there is a decrease in the population.

_____ 3. Francine loses her job because of the introduction of labor-saving machinery. Because she has few marketable skills, she stops looking for work. We would consider her to be _____ unemployed.
(a) cyclically
(b) frictionally
(c) structurally
(d) None of the above

_____ 4. Labor-saving robots are introduced into a car assembly line. The resulting unemployment is
(a) frictional.
(b) structural.

(c) mechanical.
(d) cyclical.

_____ 5. Arbez is producing at the full-employment level of production. There is
(a) no unemployment.
(b) some frictional and structural unemployment.
(c) some cyclical unemployment.
(d) a maximum participation rate.

_____ 6. Recently, a flood of cheap computer chips has poured over the border from Arboc to Arbez. Thousands of workers in the Arbezani computer chip industry have lost their jobs. This unemployment is best described as
(a) frictional.
(b) structural.
(c) competitive.
(d) cyclical.

_____ 7. Oliver Sudden has been jobless for the last six weeks, and he is still looking for the right job. He has job offers that are appropriate for his skills and that pay well. He is
(a) frictionally unemployed.
(b) structurally unemployed.
(c) cyclically unemployed.
(d) a discouraged worker.

_____ 8. A fully anticipated increase in the inflation rate can lead to
(a) increased efficiency.
(b) greater speculative activity.
(c) higher market interest rates.
(d) a decrease in barter.

_____ 9. Unanticipated inflation erodes the purchasing power of money. _____ is hurt least by unanticipated inflation.
(a) A person on a fixed income
(b) A lender
(c) A creditor
(d) A borrower

_____ 10. The Consumer Price Index has risen from 110 to 121 during the last year. We should estimate the annual inflation rate for the last year at about
(a) 9.1%.
(b) 10%.
(c) 11%.
(d) 12%.

_____ 11. With unanticipated inflation, there will be all of the following EXCEPT
(a) greater risks involved in long-term contracts.
(b) less investment.
(c) more rapid growth in the economy.
(d) falling real rewards for lenders.

_____ 12. Your real wage has risen by 3% whereas the inflation rate has risen by 7%. Your nominal wage must have
(a) risen by 4%.
(b) risen by 10%.
(c) fallen by 4%.
(d) fallen by 10%.

_____ 13. As the economy moves out of a recession, the discouraged-worker effect will tend to _____ the unemployment rate.
(a) increase
(b) decrease
(c) leave unaffected
(d) have no influence on

_____ 14. Which of the following statements about the labor market is true?
(a) Discouraged workers are those workers who have voluntarily chosen to become unemployed.
(b) The labor force includes everyone over the age of 16, including those who are unemployed.
(c) The labor-force participation rate is the ratio of employed persons to the total labor force.
(d) The natural rate of unemployment is usually taken to be the sum of frictional and structural unemployment.

_____ 15. Which of the following statements about inflation is false?
(a) The real interest rate is equal to the nominal interest rate plus the anticipated inflation rate.
(b) Changes in the CPI tend to overstate changes in the cost of living.
(c) During periods of unanticipated inflation, debtors benefit at the expense of creditors.
(d) "Inflation" is an increase in the overall level of prices; when the overall level of prices decreases, it's called "deflation."

_____ 16. As a result of greater access to the Internet, there is an increase in the speed with which unemployed workers are matched with suitable jobs. This will
(a) increase the natural rate of unemployment.
(b) decrease the natural rate of unemployment.
(c) not affect the natural rate of unemployment but reduce structural unemployment.
(d) not affect the natural rate of unemployment but reduce frictional unemployment.

Use the following information to answer the next two questions. The Arbocali Bureau of Labor Statistics provides you with the following information.

Employed	360,000
Unemployed	40,000
Not in the labor force	100,000
Population (aged 16 +)	500,000

_____ 17. The Arbocali unemployment rate is
(a) 8%.
(b) 10%.
(c) 11.11%.
(d) 40%.

_____ 18. The labor-force participation rate is
(a) 36%.
(b) 40%.
(c) 72%.
(d) 80%.

_____ 19. We would expect to see each of the following during a recession EXCEPT
(a) decreased production.
(b) a worsening balance of payments.
(c) an increased incidence of psychological disorder and stress.
(d) decreased capacity utilization rates.

_____ 20. In an economy where inflation is usually unpredictable, the degree of risk associated with investment
(a) increases.
(b) decreases.
(c) depends on the nominal interest rate.
(d) is not affected.

II. APPLICATION QUESTIONS

1. Can you think of any adaptations that have been made in our economy to alleviate the redistributional effects of inflation?

2. (a) The market interest rate on a savings account is 5%. The inflation rate is 2%. Calculate the real interest rate that savings account depositors will earn.
(b) Suppose that the nominal interest rate that banks charge on loans is subject to a price ceiling of 7%. To be worthwhile, banks require a real interest rate of 4% or more. The inflation rate is currently 5%. Describe what will happen in this market.

3. The following table provides information on inflation rates and unemployment rates for Arboc over a seven-year period.

Year	Inflation Rate (%)	Unemployment Rate (%)
Year 1	0.0	7.5
Year 2	–2.0	9.0
Year 3	4.0	5.0
Year 4	6.0	4.0
Year 5	10.0	2.5
Year 6	2.0	6.0
Year 7	–4.0	10.5

Arboc has a population of 1,000,000 over the age of 16. The labor-force participation rate is 90%.

(a) Calculate the number of workers unemployed in Year 1.

(b) Calculate the number of workers employed in Year 7.

Assume that the citizens of Arboc, when trying to determine the inflation rate for the next 12 months, base their calculations solely on the current inflation rate.

(c) During the period from Year 2 to Year 5, will borrowers be gaining or losing?

(d) In Year 5, the market interest rate was 12%. Calculate the real interest rate.

4. Gilligan is a small island economy containing 10 individuals. In each of the following cases, determine if the individual is employed, unemployed, or not in the labor force. Explain your classification.

(a) Krystal Krazy, Ph.D., 32, works 20 hours per week and is looking for a full-time job.

(b) Lisa Looney, 20, is a student who is not working.

(c) Maggie Madd, 84, works 10 hours a week doing cleaning services for her son, Norman Neurotic. He pays her minimum wage.

(d) Norman Neurotic, 50, works full-time but hates his job and really wants a new job.

(e) Olivia Opprest, a housewife, does not work outside the home and isn't looking for other employment.

(f) Pete Paranoid, 40, used to work as a fisherman but believed that everyone hated him and has given up in disgust.

(g) During the entire week containing the 12th of the month, Rosie the Riveter misses work simply because she didn't feel like going in to work.

(h) BiBi Bratt, a hugely successful film star, aged 12, has earned over $10,000,000 each year for the past five years. Currently, BiBi is filming a new movie on location on Gilligan.

(i) Maxwell Edison, a full-time Ph.D. student, is involved in ground-breaking research into fiber optics. His dissertation advisor has already claimed that Maxwell's work will revolutionize telecommunications.

(j) Jenny Wren is a volunteer 10 hours a week on a Rape Crisis telephone hotline. She feels she makes an important contribution to society and would not accept a paid job if one were offered to her.

(k) Calculate Gilligan's labor-force participation rate.

(l) Calculate Gilligan's unemployment rate.

5. Using the following figures, calculate the economic quantities for each year.

	2005	2010
Total population (16+)	200 million	210 million
Labor force	130 million	144 million
Employed	120 million	125 million

		2005	2010
(a)	the labor-force participation rate	_____	_____
(b)	the number unemployed	_____	_____
(c)	the unemployment rate	_____	_____

(d) There is more likely to have been a recession in which year?

(e) The President, denying that unemployment is growing, claims that:
   (i) "We've created more jobs" and
   (ii) "Some of the unemployed in the statistics have stopped seeking work."
   How would you respond to these points?

6. Answer the questions, based on the following information.

Year	Nominal GDP (bill.)	Price Index	Real GDP (bill.)	Nominal Wage	Real Wage
Year 1	$4,486.0	108	_____	$40,000	_____
Year 2	$4,710.3	112	_____	$40,800	_____

(a) Between Year 1 and Year 2, nominal GDP has _____ by _____%.

(b) Between Year 1 and Year 2, the price level has _____ by _____%.

(c) Frank loaned Freda $500 in Year 1 to be paid back in Year 2. He guessed inflation would run at 5% and accordingly increased the interest rate on the loan. In the circumstances, who won?

(d) Calculate the real GDP figures.

(e) Now calculate the real wage of the typical worker in each year.

(f) To have maintained her/his Year 1 standard of living, the typical worker would need to have received a nominal wage of _____ in Year 2.

7. Calculate the annual rates of inflation and complete the following table.

Year	Price Index	Rate of Inflation
Year 1	100.00	—
Year 2	113.00	_____
Year 3	121.50	_____
Year 4	126.70	_____
Year 5	125.10	_____

8. The following table shows the market value of a given basket of goods in a number of selected years. The hourly nominal wage is also given.

Year	Value of Market Basket	Price Index	Rate of Increase	Nominal Wage/Hour	Rate of Increase	Real Wage/Hour
Year 1	$887.00	_____	—	$4.55	—	_____
Year 2	$993.44	_____	_____	$5.01	_____	_____
Year 3	$1,132.52	_____	_____	$5.61	_____	_____
Year 4	$1,245.78	_____	_____	$6.40	_____	_____
Year 5	$1,320.52	_____	_____	$6.98	_____	_____

(a) Use the preceding table to calculate the price index values, with Year 1 as the base year.
(b) Using the price index values, calculate the real hourly wage.
(c) Work out the rate of increase in the price index (what does it measure?) _____ , and the rate of increase in nominal wage/hour _____ .
(d) Compare the two "rates of increase" and the behavior of real wage/hour. Make up a rule of thumb linking these variables.

9. (a) Distinguish between frictional, structural, and cyclical unemployment. Give an example of each. Suggest ways in which each of these types of unemployment might be reduced.
(b) Suppose you've just become unemployed because of company cutbacks. Are you frictionally unemployed? Is it a good idea to accept the first job offer that comes along? Can you see any disadvantages to doing so?

PRACTICE TEST SOLUTIONS

I. Solutions to Multiple-Choice Questions

1. (a) Job openings exist for Phil. It's merely a case of tracking down a position. Refer to p. 129 [441] for a discussion of the types of unemployment.

2. (a) If there are more discouraged workers, the numbers on the unemployment rolls will decrease because workers who have ceased looking for a job (discouraged workers) no longer meet the definition of being "unemployed." Refer to p. 127 [439].

3. (d) Francine has stopped seeking work—she is not classified as unemployed. Refer to p. 127 [439] on discouraged workers.

4. (b) The skills of a group of workers have become obsolete, either through a change in demand or, as in this case, through a technological change. Refer to p. 129 [441].

5. (b) The concept of full employment assumes that some (frictional and structural) unemployment will be present. Refer to p. 129 [441].

6. (b) The new Arbocali computer chip industry represents a structural change. U.S. car and steel workers have experienced similar unemployment.

7. (a) We don't know why Oliver became unemployed in the first place, but we do know that he can accept several suitable jobs—he has desirable job skills.

8. (c) The nominal (or market) interest rate is the real interest rate plus the anticipated inflation rate. Refer to p. 133 [445].

9. (d) A borrower pays a lower rate of interest than s/he should have if inflation had been fully anticipated. In fact, if inflation is very high, the cost of a loan may be zero or negative. Refer to p. 133 [445].

10. (b) The inflation rate = (change in CPI/initial CPI) × 100 = (11/110) × 100% = 10%.

11. (c) If investment falls (as it will because unanticipated inflation hurts lenders), the economy will grow less rapidly because fewer capital resources are being created.

12. (b) If the nominal wage rose by 7% and the inflation rate rose by 7%, the real wage would not have changed. For the real wage to have risen by 3%, the nominal wage must have risen by more than 7%—10%, in fact.

13. (a) Discouraged workers, seeing an improving economy, will begin to look for jobs—and will be counted as unemployed whereas, previously, they were not.

14. (d) Refer to p. 127 [439]. Discouraged workers aren't classified as unemployed. The labor force includes those over the age of 16 who are, or who wish to be, employed. The labor-force participation rate is the number in the labor force divided by the population.

15. (a) The real interest rate is equal to the nominal interest rate minus the anticipated inflation rate.

16. (b) Structural and frictional unemployment should both be reduced, as will the natural rate (the sum of structural and frictional unemployment).

17. (b) The labor force is the population minus those not in the labor force (500,000 – 100,000). The unemployment rate equals the number unemployed divided by the labor force. In this case, the unemployment rate equals 40,000/400,000, or 10%.

18. (d) The labor-force participation rate equals the number in the labor force (400,000) divided by the population (500,000). Refer to p. 124 [436].

19. (b) As the economy slows down, fewer imports are bought.

20. (a) The more unpredictable a situation is, the riskier it is. Refer to p. 133 [445].

II. Solutions to Application Questions

1. Adjustable-rate mortgages, indexation of the tax system, and indexation of pension benefits are a few of the changes.

2. (a) The real interest rate (3%) equals the market interest rate (5%) minus the inflation rate (2%).
   (b) There will be an excess demand for loans. In fact, loans will dry up. The maximum nominal interest rate is 7%; with inflation, the maximum real interest rate is 2%, which is insufficient to induce banks to lend.

3. (a) $900{,}000 \times 0.075 = 67{,}500$
   (b) $900{,}000 \times 0.895 = 805{,}500$
   (c) Inflation is increasing—borrowers gain and creditors lose.
   (d) The market interest rate is based on the real interest rate plus the expected inflation rate. In Year 5, the market interest rate was 12% and the expected inflation rate was 10% (based on the current inflation rate). The real interest rate was 2%.

4. (a) Krystal is employed.
   (b) Lisa is not in labor force.
   (c) Employed—Maggie is paid and employed.
   (d) Norman is employed.
   (e) Olivia is not in labor force.
   (f) Pete is not in labor force.
   (g) If Rosie is temporarily absent, with or without pay, she is considered employed.
   (h) BiBi is not in the labor force. She is less than 16 years old.
   (i) Maxwell is not in the labor force. He is a full-time student.
   (j) Jenny is not in the labor force. She is not seeking a job nor does she meet the criteria required to be classified as employed.
   (k) 4/9 = 0.44, or 44%. Bratt is neither in the population over 16 years of age nor in the labor force.
   (l) No one is unemployed in this economy.

5. (a) The labor-force participation rate is labor force/population. In 2005, 130/200 = 65%; in 2010, 144/210 = 68.57%.
   (b) Labor force equals the number employed plus the number unemployed. In 2005, the number unemployed = 130 million – 120 million = 10 million; in 2010, the number unemployed = 144 million – 125 million = 19 million.
   (c) The unemployment rate = number unemployed/labor force. In 2005, number unemployed/labor force = 10/130 = 7.69%; in 2010, number unemployed/labor force = 19/144 = 13.9%.
   (d) 2010x, because the unemployment rate is higher in 2005.
   (e) (i) It is possible for a growing economy to experience rising employment and rising unemployment but, if the increase in the participation rate outstrips the increase in job openings, the unemployment rate will rise.
   (ii) If, indeed, some individuals have stopped seeking work, then they would have dropped off the unemployment rolls. Admitting the presence of discouraged workers, on top of the listed unemployed, actually makes the President's performance worse!

6. (a) risen; 5%; percentage change = (change in nominal GDP/initial GDP) × 100 = (224.3/4,486) × 100 = 5%

(b) risen; 3.7%; percentage change = (change in price index/initial price index) × 100 = (4/108) × 100 = 3.7%

(c) Frank as creditor, because anticipated inflation was greater than the actual inflation rate.

(d) Refer to the following table. Real GDP = (nominal GDP/price index) × 100
Example: Real GDP for Year 1 = (4,486/108) × 100 = 4,153.7.

Year	Nominal GDP (bill.)	Price Index	Real GDP (bill.)	Nominal Wage	Real Wage
Year 1	$4,486.0	108	$4,153.7	$40,000	$37,037.04
Year 2	$4,710.3	112	$4,205.6	$40,800	$36,428.57

(e) Refer to the preceding table. Real wage = (nominal wage/price index) × 100.
Example: Real wage for Year 1 = ($40,000/108) × 100 = $37,037.04

(f) Real wage in Year 1 was $37,037.04 ($40,000/1.08). To maintain the same value in Year 2, (x/1.12) = $37,037.04. Therefore, x = $37,037.04(1.12) = $41,481.48.

7. Refer to the following table.
Example: rate of inflation for Year 3 = [(121.5 – 113)/113] × 100 = 7.52%.

Year	Price Index	Rate of Inflation
Year 1	100.00	—
Year 2	113.00	13.00%
Year 3	121.50	7.52%
Year 4	126.70	4.28%
Year 5	125.10	–1.26%

8. (a) Refer to the following table.
Example: price index for Year 2 = (nominal value in Year 2/nominal value in base year) × 100 = (993.44/1,132.52) × 100 = 87.72.

Year	Value of Market Basket	Price Index	Rate of Increase	Nominal Wage/Hour	Rate of Increase	Real Wage/Hour
Year 1	$887.00	78.32	—	$4.55	—	$5.81
Year 2	$993.44	87.72	12.0%	$5.01	10.1%	$5.71
Year 3	$1,132.52	100.00	14.0%	$5.61	12.0%	$5.61
Year 4	$1,245.78	110.00	10.0%	$6.40	14.1%	$5.82
Year 5	$1,320.52	116.60	6.0%	$6.98	9.1%	$5.98

(b) Refer to the preceding table. Example: real hourly wage for Year 2 = (nominal wage in Year 2/price index) × 100 = ($5.01/0.8772) × 100 = $5.71.

(c) Inflation. Refer to the preceding table. Example: rate of increase in nominal wage for Year 2 = [(nominal wage in Year 2 – nominal wage in Year 1)/nominal wage in Year 1] × 100 = ($0.46/$4.55) × 100 = 10.1%.

(d) When inflation is rising faster than the rate of increase in the nominal wage, the real wage will fall.

9. (a) Refer to the definitions on p. 129 [441]. A graduate in economics or business entering the job market is frictionally unemployed. The graduate has desirable qualifications; it's only a matter of tracking down an acceptable job. Defense industry workers and military personnel are becoming structurally unemployed as a result of the end of the Cold War. "Restructuring" at IBM is another example. Cyclical unemployment occurred during the recession of 1991 as consumer confidence plummeted and demand declined and, more recently, during the mild recession of 2001.

(b) If the company cutbacks are due to a fall in demand that is being felt nationwide, you are cyclically unemployed. If this one industry is affected, perhaps due to aggressive foreign competition, you are structurally unemployed. Whether you should accept the first job that is offered depends on the costs and benefits of staying unemployed. If you think it unlikely that a sufficiently better job offer will materialize that will cover the costs of a continued search, you should accept.