Key Concepts

Employment and Unemployment

Unemployment is a problem for both the unemployed worker and for society. Unemployed workers lose income and, if prolonged, lose human capital. Governments work to measure unemployment and to limit unemployment.

The U.S. Census Bureau divides the working-age population (those people aged 16 years and over who are not in jail, hospital, or other institution) into categories:

- Employed — people working at a full-time or part-time job.
- Unemployed — people who are (1) without a job but have made efforts to find a job within the past four weeks; or, (2) waiting to be called back to work from a layoff; or, (3) waiting to start a new job within 30 days.
- Not in the labor force — people who are not employed and not looking for work, that is, are not unemployed.

The labor force equals the sum of employed plus unemployed workers.

- Unemployment rate — the percentage of people in the labor force who are unemployed. The unemployment rate equals

\[
\frac{\text{Number of people unemployed}}{\text{Labor force}} \times 100
\]

The unemployment rate in June 2012 was 8.2 percent. From 1980 to 2010, the average unemployment rate was 6.4 percent. It rises during recessions.

- Employment-to-population ratio — the percentage of working age people who have jobs.

The employment-to-population ratio equals

\[
\frac{\text{Number of people employed}}{\text{Working-age population}} \times 100
\]

Between 1980 to 2000 this ratio generally increased and after 2000 it has generally decreased. In June 2012 it was 58.5 percent. The employment-to-population ratio falls during recessions.

- Labor force participation rate — the percentage of the working-age population who are members of the labor force. The labor force participation rate equals

\[
\frac{\text{Labor force}}{\text{Working-age population}} \times 100
\]

Similar to the employment-to-population ratio, the labor force participation rate generally increased until 2000 after which it decreased. In June 2012 the labor force participation rate was 63.7 percent. It falls during recessions because of unemployed workers who temporarily leave the labor force during the recession.

As a measure of the underutilization of labor, the unemployment rate has several problems: It excludes some underutilized workers, such as marginally attached workers, or part-time workers who want full-time jobs.

Underutilized labor includes marginally attached workers, who currently are neither working nor looking for work but have indicated that they want and are available for a job and have looked for work sometime in the recent past. Some marginally attached workers are discouraged workers, who are available and willing to work but have not made specific efforts to find a job within the previous four weeks. Discouraged workers are not in the labor force. Also part of underutilized labor are part-time workers who want full-time jobs. Different measures of unemployment include some of this underutilized labor:

- U-1 — the unemployment rate of workers un-
employed for 15 weeks or more.

- U-2—the unemployment rate of workers who are job losers.
- U-3—the “official” unemployment rate.
- U-4—U-3 plus discouraged workers.
- U-5—U-3 plus all marginally attached workers.
- U-6—U-5 plus part-time workers who want full-time jobs.

### Unemployment and Full Employment

Some unemployment is inevitable because unemployment arises from search in a dynamic, changing economy.

Unemployment is classified into three types:

- **Frictional unemployment** — the result of normal labor market turnover, such as people entering or leaving the labor force and from the ongoing creation and destruction of jobs. Frictionally unemployed workers are searching for good job matches.

- **Structural unemployment** — the result of changes in technology or international competition that change the skills needed to perform jobs or change the location of jobs.

- **Cyclical unemployment** — the higher than normal unemployment that arises at a business cycle trough and the lower than normal unemployment that exists at a business cycle peak. Cyclical unemployment increases during recessions and decreases during expansions.

Also creating unemployment are **efficiency wages**, wages set above the market wage, and minimum wages that are set by law and are above the market wage.

**Full employment** occurs when the unemployment rate equals the natural unemployment rate. The **natural unemployment rate** is the unemployment rate when there is no cyclical unemployment. The natural unemployment rate equals the sum of the frictional and structural unemployment rates. The quantity of GDP at full employment is potential GDP.

The **output gap** is the gap between real GDP and potential GDP. Over the business cycle, unemployment fluctuates around the natural unemployment rate and real GDP fluctuates around potential GDP.

- When real GDP is greater than potential GDP, the output gap is positive and the unemployment rate is less than the natural unemployment rate.

### The Price Level, Inflation, and Deflation

The **price level** is the average level of prices. It differs from the **inflation rate**, which is the annual percentage change of the price level. A persistently rising price level is called **inflation** and a persistently falling price level is called **deflation**.

Unexpected bouts of inflation or deflation redistribute income and wealth and also lower real GDP and employment by diverting resources from production.

A **hyperinflation** is a period when the inflation rate is exceedingly high and workers are paid twice a day because money is losing its value so rapidly. At such rates, inflation causes economic chaos.

**Consumer Price Index (CPI)** is a measure of the average of the prices paid by urban consumers for a fixed basket of consumer goods and services. The CPI is defined to equal 100 for a period called the **reference base period**.

- The CPI **basket** contains the goods and services purchased by urban consumers. Each month the cost of the CPI basket is determined by a monthly price survey.

The CPI equals the current cost of basket divided by the cost in the base period multiplied by 100:

\[
\text{CPI} = \frac{\text{Cost of CPI basket at current prices}}{\text{Cost of CPI basket at base - period prices}} \times 100.
\]

The inflation rate is equal to:

\[
\left(\frac{\text{CPI this year}}{\text{CPI last year}}\right) - 1 \times 100.
\]

The CPI oversstates the actual inflation rate for four reasons:

- **New goods bias** — new, higher priced goods replace older goods.
- **Quality change bias** — higher prices can reflect quality improvements.
- **Commodity substitution bias** — consumers shift their purchases away from goods whose relative prices rise toward lower priced goods.
- **Outlet substitution bias** — people switch to low-cost discount stores when facing higher prices.

The CPI is estimated to overstate inflation by 1.1 percentage points per year.
Three alternatives to the CPI are:

- Chained CPI — a price index calculated using current and previous period quantities, thereby overcoming the biases in the CPI.
- Personal consumption expenditure deflator — a price index calculated for the consumption expenditure component of GDP. The PCE deflator equals:
  \[
  \frac{\text{Nominal consumption}}{\text{Real consumption}} \times 100.
  \]
- GDP deflator — a price index calculated for GDP. The GDP deflator equals:
  \[
  \frac{\text{Nominal GDP}}{\text{Real GDP}} \times 100.
  \]

**Core inflation rate** — the inflation rate that excludes volatile elements. In practice, this measure excludes energy and food prices.

Dividing a nominal variable by the price level deflates the nominal variable and converts it into a real variable. For example, the real wage rate equals:

\[
\frac{\text{Nominal wage rate}}{\text{Price level}}.
\]

The exception to this process is the nominal interest rate, which is adjusted using another method.

### Helpful Hints

1. **FULL EMPLOYMENT**: Remember that full employment does not mean that everyone has a job. Rather, it means that the only unemployment is frictional and structural in nature—cyclical unemployment is zero. When there is no cyclical unemployment, the unemployment rate is the natural unemployment rate.

   The actual unemployment rate can be less than the natural unemployment rate, so that the employment can exceed full employment. In these situations, people spend too little time searching for jobs, and therefore less productive job matches are made. Conversely, the actual unemployment rate can exceed the natural unemployment rate, so that employment is less than full employment. In this case, too many workers are searching for jobs and the economy is able to produce fewer goods and services.

### Questions

**True/False and Explain**

<table>
<thead>
<tr>
<th>Employment and Unemployment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Full-time students not looking for work are counted as unemployed.</td>
</tr>
<tr>
<td>2. The unemployment rate equals the total number of unemployed workers divided by the total working-age population.</td>
</tr>
<tr>
<td>3. Lesline lost her job and looked for a new job for eight months. She stopped looking for work because she believes she cannot find a job. Lesline is counted as unemployed.</td>
</tr>
<tr>
<td>4. The unemployment rate rises during recessions.</td>
</tr>
<tr>
<td>5. The labor force participation rate has been consistently rising since 1980.</td>
</tr>
<tr>
<td>6. Discouraged workers are included in the U-4 unemployment rate.</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Unemployment and Full Employment</th>
</tr>
</thead>
<tbody>
<tr>
<td>7. Frictional unemployment will always exist.</td>
</tr>
<tr>
<td>8. Bill has just graduated from high school and is looking for his first job. Bill is frictionally unemployed.</td>
</tr>
<tr>
<td>9. Cyclical unemployment results from business cycle fluctuations.</td>
</tr>
<tr>
<td>10. The natural unemployment rate equals the sum of frictional and structural unemployment rates.</td>
</tr>
<tr>
<td>11. At full employment, there is no unemployment.</td>
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<tr>
<td>12. Real GDP can never be greater than potential GDP.</td>
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<td>13. If potential GDP is less than real GDP, the output gap is negative.</td>
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</table>

**The Price Level, Inflation, and Deflation**

<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>14. The inflation rate can never be negative.</td>
</tr>
<tr>
<td>15. The CPI basket used in calculating the CPI changes each year.</td>
</tr>
<tr>
<td>16. Consumers shift their purchases away from goods whose relative prices increase and thereby cause the CPI to overstate the actual inflation rate.</td>
</tr>
</tbody>
</table>
Multiple Choice

Employment and Unemployment

1. Suppose a country has 150 million workers employed and 10 million unemployed. There also are 100 million people over age 16 and not in jail, hospital, or other form of institutional care and who are not in the labor force. The working-age population in this country equals
   a. 260 million.
   b. 160 million.
   c. 110 million.
   d. 250 million.

2. Who of the following is counted as unemployed by the Census Bureau?
   a. Alex, who does not have a job and who last looked for work seven weeks ago.
   b. Justin, who is working 15 hours per week and wants a full-time job.
   c. Jacob, who will start a new job at the headquarters of Starbucks in 18 days.
   d. All of the above people are counted as unemployed.

3. In a country with a working-age population of 200 million, 130 million workers are employed and 10 million are unemployed. The labor force equals
   a. 200 million.
   b. 140 million.
   c. 130 million.
   d. 10 million.

4. In a country with a working-age population of 200 million, 130 million workers are employed and 10 million are unemployed. The unemployment rate is
   a. 5.0 percent.
   b. 7.1 percent.
   c. 7.7 percent.
   d. 65.0 percent.

5. In a country with a working-age population of 200 million, 130 million workers are employed and 10 million are unemployed. The labor force participation rate is
   a. 100 percent.
   b. 70 percent.
   c. 65 percent.
   d. 5 percent.

6. Since 1980 the labor force participation rate
   a. has fallen almost every year.
   b. fell until about 2000 after which it started to rise again.
   c. has not changed very much, with some years rising and other years falling.
   d. rose until about 2000 after which it has fallen.

7. The employment-to-population generally rises during recessions. The employment-to-population ratio and labor force participation rate both generally rose from 1980 until 2000 after which both have generally fallen.
   a. Both sentences are correct.
   b. The first sentence is correct and the second sentence is incorrect.
   c. The first sentence is incorrect and the second sentence is correct.
   d. Both sentences are incorrect.

8. Who of the following is a discouraged worker?
   a. Cara, who lost her job because of foreign competition and is unemployed until retrained.
   b. Omar, a fishery worker who is searching for a better job closer to home.
   c. Eugene, a steelworker who was laid off but has stopped looking for a new job because the economy is in a recession and he thinks he won’t be able to find a job.
   d. Amanda, an office worker who lost her job because of a slowdown in economic activity.

9. Marginally attached workers are included in the calculation of the U-5 unemployment rate, so compared to the conventional U-3 unemployment rate
   a. U-5 is larger than U-3.
   b. U-5 typically rises when U-3 falls.
   c. U-5 is sometimes larger than U-3 and sometimes smaller than U-3.
   d. U-5 fluctuates less than U-3.

Unemployment and Full Employment

10. Unemployment resulting from normal labor market turnover is called
    a. cyclical unemployment.
    b. frictional unemployment.
    c. structural unemployment.
    d. cycle unemployment.
11. Unemployment resulting from a recession is called
   a. cyclical unemployment.
   b. frictional unemployment.
   c. structural unemployment.
   d. cycle unemployment.

12. Who of the following is frictionally unemployed?
   a. Cara, who lost her job because of foreign competition and is unemployed until retrained.
   b. Omar, a fishery worker who is searching for a better job closer to home.
   c. Eugene, a steelworker who was laid off but has stopped looking for a new job because the economy is in a recession and he thinks he won’t be able to find a job.
   d. Amanda, an office worker who lost her job because of a slowdown in economic activity.

13. Who of the following is structurally unemployed?
   a. Cara, who lost her job because of foreign competition and is unemployed until retrained.
   b. Omar, a fishery worker who is searching for a better job closer to home.
   c. Eugene, a steelworker who was laid off but has stopped looking for a new job because the economy is in a recession and he thinks he won’t be able to find a job.
   d. Amanda, an office worker who lost her job because of a slowdown in economic activity.

14. Who of the following is cyclically unemployed?
   a. Cara, who lost her job because of foreign competition and is unemployed until retrained.
   b. Omar, a fishery worker who is searching for a better job closer to home.
   c. Eugene, a steelworker who was laid off but has stopped looking for a new job because the economy is in a recession and he thinks he won’t be able to find a job.
   d. Amanda, an office worker who lost her job because of a slowdown in economic activity.

15. At the natural unemployment rate, there is no
   a. frictional unemployment.
   b. structural unemployment.
   c. cyclical unemployment.
   d. unemployment.

16. If the economy is at full employment,
   a. the entire population is employed.
   b. the entire labor force is employed.
   c. the only unemployment is frictional unemployment plus discouraged workers.
   d. real GDP equals potential GDP.

17. If the output gap is positive, then
   a. cyclical unemployment is positive.
   b. the unemployment rate is less than the natural unemployment rate.
   c. the natural unemployment rate is less than the cyclical unemployment rate.
   d. potential GDP exceeds real GDP.

The Price Level, Inflation, and Deflation

18. When the CPI is calculated,
   a. a new CPI basket must be used each month.
   b. last year’s prices are used to avoid temporary changes in prices.
   c. the cost of the CPI basket in the base period is divided by the cost of the CPI basket in the current period.
   d. None of the above answers is correct.

19. At the end of last year, the CPI equaled 120. At the end of this year, the CPI equals 132. What is the inflation rate over this year?
   a. 6 percent
   b. 10 percent
   c. 12 percent
   d. None of the above answers are correct because more information is needed to calculate the inflation rate.

20. The commodity substitution bias reflects the point that
   a. consumers often substitute high-quality goods for low-quality goods.
   b. government expenditure is a good substitute for investment expenditure.
   c. prices of goods and services sold by some retailers are higher than the prices of the same goods and services when sold by other retailers.
   d. consumers decrease the quantity they buy of goods whose relative prices rise and increase the quantity of goods whose relative price falls.
21. The core CPI inflation rate differs from the CPI inflation rate because the core CPI inflation rate
   a. uses prices for only necessities, that is, the core elements consumers must buy.
   b. omits the prices of foreign produced goods and services.
   c. removes the effects from volatile prices, such as the prices of food and energy.
   d. the core CPI inflation rate is a real variable and the CPI inflation rate is a nominal variable.

**Short Answer Problems**

1. What are the costs of unemployment?

**TABLE 5.1**

<table>
<thead>
<tr>
<th>Short Answer Question 1</th>
<th>2012</th>
<th>2013</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Price</td>
<td>Quantity</td>
</tr>
<tr>
<td>Rutabaga</td>
<td>$0.50</td>
<td>200</td>
</tr>
<tr>
<td>Parka</td>
<td>$50.00</td>
<td>2</td>
</tr>
<tr>
<td>Book</td>
<td>$40.00</td>
<td>5</td>
</tr>
</tbody>
</table>

2. Complete Table 5.1.

3. Can the unemployment rate increase while the total amount of employment also increases? Be sure to take account of the behavior of discouraged workers in your answer.

4. Briefly describe the trends in the labor force participation rate and employment-to-population ratio since 1980.

5. For the following time periods, describe Igor’s labor market status. When Igor is unemployed, tell whether it is frictional, structural, or cyclical unemployment.
   a. From January 1 through June 30, 2012, Igor was a full-time student pursuing his bachelor’s degree.
   b. On July 1, Igor graduated with his degree in body building. He spent three months looking for work before Dr. Frankenstein hired him on October 1.
   c. From October 1 to January 1, 2013, Igor worked full-time on the night shift.
   d. On January 1, because of generally worsening economic conditions, Igor was put on part-time on the night-shift even though he wanted to work full time.
   e. On February 28, as economic conditions worsened, Dr. Frankenstein fired Igor. Igor looked for work until May 1.
   f. On May 1, Igor became convinced that he couldn’t find a job, so until October 31 Igor tended house and dug in his garden but did not look for work.
   g. On October 31, Count Dracula dropped by for a bite and offered Igor a job, which Igor accepted.

**TABLE 5.2**

**Consumption in Snowville**

<table>
<thead>
<tr>
<th>2012</th>
<th>2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rutabaga</td>
<td>$0.50</td>
</tr>
<tr>
<td>Parka</td>
<td>$50.00</td>
</tr>
<tr>
<td>Book</td>
<td>$40.00</td>
</tr>
</tbody>
</table>

6. In 2012, consumers in Snowville consumed only rutabagas, parkas, and books. The prices and quantities for 2012 and 2013 are listed in Table 5.2. The reference base period for Snowville’s CPI is 2012.
   a. What is the CPI for Snowville in 2012?
   b. What is the CPI for Snowville in 2013?
   c. What is the inflation rate between 2012 and 2013?

7. Calculate the GDP deflator for the pairs of nominal GDP and real GDP below.
   a. Nominal GDP $15 trillion, real GDP $10 trillion.
   b. Nominal GDP $14 trillion, real GDP 12 trillion.
   c. Nominal GDP $16 trillion, real GDP $12 trillion.

**You’re the Teacher**

1. “I really don’t understand why we bother with the ideas of ‘frictional,’ ‘structural,’ and ‘cyclical’ unemployment. I mean, unemployment is unemployment, so who really cares about these types?” Your friend is being unnecessarily nega-
tive; explain why understanding these different types of unemployment is useful.

2. “Okay, now I see that the book is right — we should divide unemployment into frictional, structural, and cyclical. But, I still can’t see why we should have any unemployment. I think that the government should reduce the unemployment rate to zero because that has to be best for the nation!” Your friend sees some of the lessons from the book, but your friend’s vision is far from 20/20. Help this student by explaining why a goal of zero unemployment is neither realistic nor desirable.
True/False Answers

Employment and Unemployment
1. F These students are not in the labor force.
2. F The unemployment rate equals the total number of unemployed workers divided by the labor force, not the total working-age population.
3. F Lesline is not in the labor force because she stopped looking for a job and so is not counted as unemployed.
4. T When real GDP falls during a recession, the unemployment rate rises.
5. F The labor force participation rate rose until 2000 but has fallen since then.
6. T To be counted as unemployed, a worker must be looking for work. Discouraged workers have stopped looking for a job and so are not counted as unemployed.

Unemployment and Full Employment
7. T Frictional unemployment results from the normal churning in the labor market.
8. T Bill is part of the normal turnover in the labor market and thus is frictionally unemployed.
9. T Cyclical unemployment rises during recessions and falls during expansions.
10. T The natural unemployment rate is defined to be the sum of the frictional and the structural unemployment rates.
11. F At full employment, the unemployment rate equals the natural rate, and is made up of frictional and structural unemployment.
12. F When the unemployment rate is less than the natural unemployment rate, real GDP is greater than potential GDP.
13. F The output gap equals real GDP minus potential GDP so when real GDP exceeds potential GDP, the output gap is positive.

Multiple Choice Answers

Employment and Unemployment
1. a The working age population equals the sum of employed workers (150 million), unemployed workers (10 million), and people over 16 (not in jail, a hospital, or some other form of institutional control) who are not in the labor force (100 million), or 260 million.
2. c Jacob is counted as unemployed because he is waiting, for 30 or fewer days, to begin a new job.
3. b The labor force equals the sum of employed workers (130 million) and unemployed workers (10 million), or 140 million.
4. b The unemployment rate equals the number of unemployed workers divided by the labor force, multiplied by 100.
5. b The labor force participation rate equals the percentage of the working-age population in the labor force, that is, the total labor force (140 million) divided by the total working-age population (200 million), multiplied by 100.
6. d The labor force participation rate has fallen since 2000 and is about 64 percent in 2012.
7. c The employment-to-population ratio falls during recessions.
8. c Eugene has stopped looking for work, so he is no longer considered an unemployed worker.
9. a Including marginally attached workers among the ranks of the unemployed raises the unemployment rate, but the increase is small.

Unemployment and Full Employment
10. b The normal labor market turnover will always be present which means that frictional unemployment will always be present.
11. a Cyclical unemployment is positive when the economy is in a recession and negative when it is an expansion.

12. b Omar is part of the normal turnover in the labor force, so he is frictionally unemployed.

13. a Cara lost her job because of structural change (more foreign competition) in the economy, so she is structurally unemployed.

14. d Amanda’s job was lost because of a recession, so Amanda is cyclically unemployed.

15. c The natural rate consists of only frictional and structural unemployment.

16. d Potential GDP equals actual GDP when the economy is at full employment.

17. b The output gap equals real GDP minus potential GDP. When real GDP exceeds potential GDP, the output gap is positive and the unemployment rate is less than the natural unemployment rate.

The Price Level, Inflation, and Deflation

18. d The CPI basket does not change from one month to the next; the CPI uses current period prices; and, the CPI equals the cost of the CPI basket in the current period divided by the cost of the CPI basket in the base period.

19. b The inflation rate is the percentage change in the price index, \( \frac{132 - 120}{120} \times 100 \), or 10 percent.

20. d In part because of the commodity substitution bias, the CPI overstates the true increase in the cost of living.

21. c The core CPI inflation attempts to reveal the underlying trend in inflation.

Answers to Short Answer Problems

1. There are two important costs of unemployment: one “paid” immediately and the other incurred over a longer time horizon. First, and immediately, unemployed workers suffer a loss of income and the nation loses production. Second, and perhaps equally significant, when workers are unemployed for long periods of time, their skills and abilities deteriorate, which hurts their future job prospects.

2. The answers are in Table 5.3. To calculate them, use the definition that the labor force equals the sum of employed and unemployed workers. Hence in the first line the total labor force equals 100 + 10 or 110. In the second line, the number of unemployed workers equals the labor force, 100, minus the total number of employed workers, 80. In this case the number of unemployed workers is 20.

Next, make use of the result that the unemployment rate equals the total number of unemployed workers divided by the labor force, multiplied by 100. So in the first row the unemployment rate equals \( \frac{10}{110} \times 100 \), which is 9.1 percent. In the third row, rearranging the definition of the unemployment rate shows that the total number of unemployed workers equals the unemployment rate multiplied by the labor force. Hence in the third row the total number of unemployed workers is (5.0 percent \( \times \) 200) so that unemployment is 10 workers. The number of employed workers in that row therefore is 190 workers.

3. Although uncommon, both the number of employed workers and the (U-3) unemployment rate can increase at the same time. This situation occurs most often just after the trough of the business cycle when the economy moves into an expansion. In these months, the economy is growing and real GDP is expanding, so total employment rises. In addition, previously discouraged or marginally attached workers begin to believe that they might now be able to find a job. A large number of might rejoin the labor force, start searching for jobs and add significantly to the number of unemployed workers. (Recall that discouraged or marginally attached workers they were not counted as unemployed; rather
they were not in the labor force.) Hence the unemployment rate can increase even though the total number of employed workers increases.

4. Since 1980 both the labor force participation rate and the employment-to-population ratio increased until 2000. After 2000 both the labor force participation rate and the employment-to-population ratio have fallen.

5. a. As a full-time student, Igor was not in the labor force.
   b. While Igor searched for his first job, he was frictionally unemployed.
   c. When working full-time for Dr. Frankenstein, Igor was an employed worker.
   d. Even though Igor wanted full-time work, he nonetheless was still counted as (fully) employed when he was on the part-time night shift.
   e. From February 28 to May 1, Igor was cyclically unemployed because his unemployment was the result of a downturn in the economy.
   f. From May 1 to October 31, Igor was not in the labor force because he was not looking for work. Igor was a discouraged worker.
   g. Igor is employed after October 31.

<table>
<thead>
<tr>
<th>TABLE 5.4 Consumption in Snowville</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
</tr>
<tr>
<td>------</td>
</tr>
<tr>
<td>Rutabaga</td>
</tr>
<tr>
<td>Parka</td>
</tr>
<tr>
<td>Book</td>
</tr>
</tbody>
</table>

6. a. The CPI in 2012 is 100. This answer can be calculated in two ways. First, the CPI in any reference base period equals 100. Alternatively, the CPI can be calculated directly. From Table 5.4, in 2012, the CPI basket cost $(0.50 per rutabaga \times 200 rutabagas) + (50.00 per parka \times 2 parkas) + (40.00 per book \times 5 books) or $400. The CPI is defined as the ratio of the cost of the basket in the current year divided by the cost of the basket in the reference base period and the resulting answer then multiplied by 100. So, the CPI equals $\frac{(400) \times 100}{(400)}$, or 100.

b. As the first step in calculating the CPI for 2013, calculate the cost using 2013 prices of the 2012 CPI basket: $(0.70 per rutabaga \times 200 rutabagas) + (75.00 per parka \times 2 parkas) + (30 per book \times 5 books) or$440. The CPI equals 100 times the ratio of the cost of the basket in the current year divided by the cost of the basket in the reference base period, or $\frac{(440) \times 100}{(400)} = 110$.

c. The inflation rate between 2012 and 2013 equals $(110 - 100) + (100)$, or 10 percent.

7. In all cases the GDP deflator equals nominal GDP divided by real GDP and then multiplied by 100. Intuitively nominal GDP equals $P \times Q$ where $P$ is the GDP deflator and $Q$ is real GDP. Dividing nominal GDP by real GDP “cancels” the $Q$'s, real GDP, leaving only the GDP deflator.

a. GDP deflator = $(15 trillion + 10 trillion) \times 100 = 150$.

b. GDP deflator = $(14 trillion + 12 trillion) \times 100 = 116.7$.

c. GDP deflator = $(16 trillion + 12 trillion) \times 100 = 133.3$.

**You’re the Teacher**

1. “You’re right, it probably doesn’t make any difference to the unemployed worker whether he or she is frictionally, structurally, or cyclically unemployed. And determining which classification a particular unemployed worker falls into is difficult — perhaps impossible. But, this division can be very useful for us, as students, because it makes clear some of the causes of unemployment. And, once we know the causes, we can get insight into what we can do.”

“Take the idea of structural unemployment, for instance. Helping workers who are structurally unemployed has to take a different tack than helping those who are cyclically unemployed. A worker who is cyclically unemployed doesn’t necessarily need a lot of retraining. But one who is structurally unemployed may well benefit from
this type of training. So, by recognizing that structural reasons are one cause of unemployment, we can see that offering retraining may be a good idea if we want to reduce the unemployment rate."

"Now, if we hadn’t divided unemployment into different types, we might have thought that all unemployment was cyclical in nature. And in this case, we would probably have completely overlooked retraining. So dividing unemployment into three categories is helpful because it helps us see more deeply into the causes of unemployment as well as the cures for it."

2. "Look, here’s another case where the division of unemployment into frictional, structural, and cyclical unemployment can help you avoid these outlandish statements. Think about frictional unemployment: What would it take to reduce this type of unemployment to zero? I mean, the laws and regulations would be awful! For instance, you’d need a law that says you couldn’t graduate from college until you already had a job lined up because if you had to look for a job after graduation, you’d be frictionally unemployed. And once you had a job, you couldn’t leave it until you had another job lined up. I don’t know about you, but even though I like college, I don’t want to spend the rest of my life as a student and, if I get stuck in a job I hate, I want to be able to quit to look for a better one."

"You can see that reducing frictional unemployment to zero would be way too costly. The laws it would take are too strict and would really hurt our economy! It would probably be equally impossible to reduce structural unemployment to zero. But cyclical unemployment is a different issue. The more we can tame the business cycle, the more we can reduce cyclical unemployment. So, possibly what we want to aim for is to reduce cyclical unemployment to zero. In other words, forget the idea of eliminating all unemployment; let’s concentrate instead on eliminating cyclical unemployment."
Chapter Quiz

1. The U-3 unemployment rate
   a. rises during an expansion and falls during a recession.
   b. measures the percentage of the working-age population who can’t find a job.
   c. includes workers who have quit looking for work because they think they cannot find a job, that is, includes discouraged workers.
   d. equals the percentage of the labor force that is without a job.

2. In 2012, the labor force participation rate was _____ than in 2000 and the employment-to-population ratio was _____ than in 2000.
   a. higher; higher
   b. higher; lower
   c. lower; higher
   d. lower; lower

3. In a country with a working-age population of 200 million, 90 million workers are employed and 10 million are unemployed. What is the unemployment rate?
   a. 45.0 percent
   b. 11.1 percent
   c. 10.0 percent
   d. 5.0 percent

4. When the economy is at full employment, the
   a. output gap equals zero.
   b. output gap is positive.
   c. cyclical unemployment rate equals the natural unemployment rate.
   d. frictional unemployment rate and the structural unemployment rate both equal zero.

5. If nominal GDP is $18 trillion and real GDP is $15 trillion, then the GDP deflator is
   a. 180.0.
   b. 120.0.
   c. 83.3.
   d. 150.0.

6. Unemployment that is associated with changing jobs in a normally changing economy is best characterized as
   a. cyclical unemployment.
   b. structural unemployment.
   c. frictional unemployment.
   d. long-term unemployment.

7. When thirty workers are laid off because the economy has entered a recession, _____ unemployment has increased.
   a. cyclical
   b. structural
   c. frictional
   d. discouraged worker

8. When thirty workers enter the labor force after graduation from school, _____ unemployment has increased.
   a. cyclical
   b. structural
   c. frictional
   d. discouraged worker

9. When thirty workers are laid off and cannot find new jobs because they lack the necessary skills, _____ unemployment has increased.
   a. cyclical
   b. structural
   c. frictional
   d. discouraged worker

10. Which of the following is correct?
    a. The natural unemployment rate is always less than the actual unemployment rate.
    b. Frictional unemployment is the unemployment that increases in recessions and decreases in expansions.
    c. Efficiency wages help lower the natural unemployment rate.
    d. The natural unemployment rate is not zero when the economy is at full employment.

The answers for this Chapter Quiz are on page 253