ECON 1010 Principles of Macroeconomics

Solutions to Midterm Exam #2

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Section 1: Multiple Choice and T/F (60 pts). Circle the correct answer; each is worth two points.

1. The labor force is equal to the:
   a. sum of employment and unemployment.
   b. sum of the employed and the underemployed.
   c. number of people working in the economy.
   d. population minus the number of employed.

2. Unemployment is the total number of people:
   a. working fewer hours than they would like.
   b. collecting unemployment benefits.
   c. working for a wage less than what they would like.
   d. who are actively looking for work but aren't currently employed.

3. The official unemployment rate reported by the government may tend to understate the amount of unemployment because it:
   a. includes discouraged workers in the calculations.
   b. excludes discouraged workers who are not actively seeking employment.
   c. excludes teenagers from the calculations.
   **d.** includes people over 65 who aren't retired in the calculations.

4. Donna was laid off by her employer at the beginning of 2011. She looked for a job for three months, but could not find anything suitable. She then decided to volunteer for a soup kitchen and stopped looking for a job. Donna is considered to be:
   a. a discouraged worker.
   b. a part-time worker.
   c. unemployed.
   d. underemployed.

5. Economists claim that the unemployment rate can understate the true level of unemployment because none of the following groups are included, EXCEPT:
   a. discouraged workers.
   b. marginally attached workers.
   c. workers without jobs who have looked for work in the last four weeks.
   d. underemployed workers.

6. People who are in the process of changing jobs are counted in which category?
   a. frictional unemployment
   b. involuntary unemployment
   c. structural unemployment
   d. cyclical unemployment

7. Structural unemployment is:
   a. zero when the economy is in full employment.
   b. caused by short-run economic fluctuations.
   c. unemployment that results when there are more people seeking jobs than there are jobs available at the current wage rate.
   d. unemployment experienced by those entering the labor force for the first time.

8. If the actual unemployment rate is 7 percent and the cyclical unemployment rate is 2 percent, then the natural rate of unemployment is:
   a. 7 percent.
   b. 2 percent.
   c. 5 percent.
   d. 9 percent.

9. The deviations in the actual rate of unemployment away from the natural rate of unemployment is called:
   a. seasonal.
   b. cyclical.
   c. structural.
   d. frictional.

10. The sum of the frictional and structural rates of unemployment is called the:
   a. natural rate of unemployment.
   b. natural rate of employment.
   c. cyclical rate of unemployment.
   d. cyclical rate of employment.

11. According to the Bureau of Labor Statistics, the actual unemployment rate in the economy was 8.3 percent in February of 2012 and the natural rate of unemployment was 5.2 percent. The:
   a. structural unemployment rate was 4 percent.
   b. cyclical unemployment rate was 3.1 percent.
   c. cyclical unemployment rate was 14 percent
   d. frictional unemployment rate was 4 percent.

12. Which statement is FALSE?
   a. Both frictional and structural unemployment can occur even if unemployment is at its natural level.
   b. A new college graduate looking for a first professional job may experience frictional unemployment.
   c. Efficiency wages may cause frictional unemployment.
   d. Cyclical unemployment is unemployment that is in excess of that associated with the natural level of employment.

13. Figure: The Labor Market
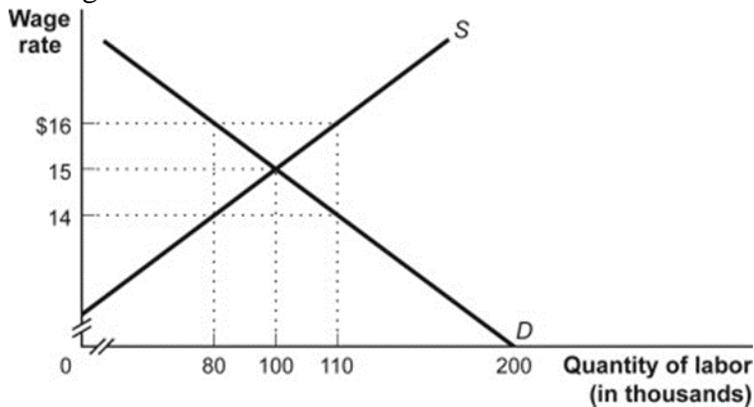
Refer to the Figure: The unemployment rate at the equilibrium wage rate is:
- **a.** 15 percent.
- **b.** 80 percent.
- **c.** 0 percent.
- **d.** 50 percent.

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14. The inflation rate is the:
- **a.** price level in the current year minus the price level in the previous year.
- **b.** price level in the current year multiplied by the price level in the previous year.
- **c.** price level in the current year plus the price level in the previous year.
- **d.** percentage change in the price level from one year to the next.

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15. Which lending agreement represents the highest real rate of return for a bank when it lends its money to a customer?
- **a.** a nominal interest rate of 12 percent with 7 percent inflation
- **b.** a nominal interest rate of 8 percent with 1 percent inflation
- **c.** a nominal interest rate of 19 percent with 15 percent inflation
- **d.** a nominal interest rate of 11 percent with 5 percent inflation

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16. The real rate of interest is the nominal rate of interest times the inflation rate.
- **a.** False
- **b.** True

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17. High rates of inflation often result in people spending inordinate amounts of time trying to make transactions and finding ways to keep the real value of their money from decreasing. This is an example of
- **a.** unit-of-account costs.
- **b.** menu costs.
- **c.** shoe-leather costs.
- **d.** efficiency wages.

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18. The measure that summarizes the aggregate price level is:
- **a.** the unemployment rate.
- **b.** a consumption bundle.
- **c.** a price index.
- **d.** GDP.

19. If the CPI changes from 120 to 125 between December 2009 and December 2010, the:
    a. deflation rate for 2010 is 5 percent.
    b. inflation rate for 2010 is 4.2 percent.
    c. deflation rate for 2010 is 4.2 percent.
    d. inflation rate for 2010 is 5 percent.

20. The annual percent change in an official price index is called the:
    a. inflation rate.
    b. adjustment index.
    c. rate of economic growth.
    d. growth index.

21. If the cost of the market basket in the base year is $2000, and the cost of the market basket in 2014 is $2100, the price index for 2014 is:
    a. 2100
    b. 100
    c. 105
    d. 95

22. The GDP deflator measures changes in the cost of a market basket of raw commodities, such as steel, electricity, and coal.
    a. True
    b. False

23. Real GDP per capita in the United States increased almost _____ between 1900 and 2010.
    a. eightfold.
    b. threefold.
    c. twofold.
    d. fiftyfold.

24. If real GDP doubles in 12 years, its average annual growth rate is approximately:
    a. 3 percent.
    b. 4 percent.
    c. 5 percent.
    d. 6 percent.

25. If output is growing at 5 percent annually, how many years will it take for output to quadruple?
    a. 10 years
    b. 20 years
    c. 14 years
    d. 28 years

26. Diminishing returns to physical capital implies that when the human capital per worker and the state of technology remain fixed, each successive increase in physical capital leads to:
    a. negative productivity.
    b. a decrease in productivity.
    c. a smaller increase in productivity.
    d. a larger increase in productivity.

27. An international comparison today shows that:
    a. resource-rich nations consistently have a higher standard of living than nations where natural resources are sparse.
    b. population growth is the most important determinant of economic growth.
    c. natural resources are less important than human and physical capital per worker in determining productivity.
    d. natural resources are the most important determinant of economic growth.

28. Which is NOT an example of infrastructure?
    a. power plants that generate electricity
    b. cell phone towers
    c. roads
    d. iron ore deposits

29. When the government invests resources in a nation's educational system, the government is said to be investing in:
    a. private property.
    b. human capital.
    c. infrastructure.
    d. political stability.

30. When studying economic growth, the concept of absolute "convergence" means that
    a. countries will eventually have equal growth rates.
    b. countries will eventually have equal inflation rates.
    c. countries will eventually have equal unemployment rates.
    d. countries will eventually have equal standards of living or real GDP per capita.

Section 2: Short Answer Questions (40 pts).

1. (16 pts) Consider labor market data for a stylized economy:

Year	Population	Employed	Unemployed
2014	310	160	25
2015	320	170	20
2016	330	172	17

a.) (8 pts) Calculate the labor force participation rate and unemployment rate for each of the three years above.

Solution:

Unemployment rates: **2014:** $Unemp.\,Rates = \frac{25}{(25+160)} \times 100 = \frac{25}{185} \times 100 = 13.5\%$

2015: $Unemp.\,Rates = \frac{20}{(20+170)} \times 100 = \frac{20}{190} \times 100 = 10.5\%$

2016: $Unemp.\,Rates = \frac{17}{(17+172)} \times 100 = \frac{17}{189} \times 100 = 9.0\%$

Labor force part. rates: **2014:** $LFPR\,Rates = \frac{185}{310} \times 100 = 59.7\%$

2015: $LFPR\,Rates = \frac{190}{320} \times 100 = 59.4\%$

2016: $LFPR\,Rates = \frac{189}{330} \times 100 = 57.2\%$

b) (8 pts) In terms of the labor force participation and unemployment rates calculated in part (a), discuss whether the labor market has been strengthening or weakening during the three years shown above. Defend your answer and consider more than one possible explanation for the observed trends.

Solution: In terms of the unemployment rate, the labor market appears to be strengthening. There are fewer people unemployed and the unemployment rates have been falling. Generally, this is considered a positive trend. However, it is possible that the decline in the number of unemployed is caused by unemployed individuals becoming frustrated and dropping out of the labor force. This is a possibility.

In terms of the labor force participation rates, labor markets appear to be weakening. The rates are declining over the sample period. Although more people are employed, the number in the labor force is a declining portion of the overall population. It is possible, however, that this downward trend could be misleading if older workers are retiring or more people are going back to school. This will make it appear as if the labor market is weakening, when in reality retirement and education are considered two positive features of the labor market.

The take-home message is that labor market numbers are complicated and can be interpreted in multiple ways.

2. (24 pts) Consider the quantity of production and prices for a two-good stylized economy as depicted in the table below. Assume for any calculations that the base year is 2014.

Year	Quantity Good X	Price per unit of X	Quantity Good Y	Price per unit of Y
2014	200	5	150	10
2015	150	10	200	10
2016	100	15	250	8

a) (8 pts) Calculate the GDP deflator for each of the three years in the table. What is the inflation rate between 2014 and 2015? Between 2015 and 2016?

Solutions:

Nominal GDP: 2014: $GDP = (200 \times \$5) + (150 \times \$10) = \$2500$

2015: $GDP = (150 \times \$10) + (200 \times \$10) = \$3500$

2016: $GDP = (100 \times \$15) + (250 \times \$8) = \$3500$

Real GDP: 2014: $GDP = \$2500$

2015: $GDP = (150 \times \$5) + (200 \times \$10) = \$2750$

2016: $GDP = (100 \times \$5) + (250 \times \$10) = \$3000$

GDP deflator: 2014: $GDP\ deflator = 100$

2015: $GDP = \frac{\$3500}{\$2750} \times 100 = 127$

2016: $GDP = \frac{\$3500}{\$3000} \times 100 = 117$

Inflation Rate: 2014-15: $\pi = \frac{(127-100)}{100} \times 100 = 27\%$

2015-16: $\pi = \frac{(117-127)}{127} \times 100 = -7.9\%$

b) (8 pts) Assuming that a market basket for a typical consumer is given by two X and three Y (i.e., X = 2 & Y = 3) and 2014 is the base year, calculate the CPI for each of the three years in the table. What is the inflation rate between 2014 and 2015? Between 2015 and 2016?

Solutions:

$$\text{CPI: 2014: } CPI = \frac{(2 \times \$5) + (3 \times \$10)}{(2 \times \$5) + (3 \times \$10)} \times 100 = 100$$

$$\text{2015: } CPI = \frac{(2 \times \$10) + (3 \times \$10)}{(2 \times \$5) + (3 \times \$10)} \times 100 = \frac{\$50}{\$40} \times 100 = 125$$

$$\text{2016: } CPI = \frac{(2 \times \$15) + (3 \times \$8)}{(2 \times \$5) + (3 \times \$10)} \times 100 = \frac{\$54}{\$40} \times 100 = 135$$

$$\text{Inflation Rate: 2014-15: } \pi = \frac{(125 - 100)}{100} \times 100 = 25\%$$

$$\text{2015-16: } \pi = \frac{(135 - 125)}{125} \times 100 = 8\%$$

c) (8 pts) On an annual basis, how fast has the real economy grown between 2014 and 2016? Using this rate, how long will it take the economy to double in size? Defend your answer.

Solution: The best measure of economic growth is real GDP. The growth rate in real GDP between 2014 and 2016 is

$$\textit{Real GDP growth}_{2014-2016} = \frac{(\$3000 - \$2500)}{\$2500} \times 100 = 20\%.$$

On an annual basis, this is approximately 10% growth. Using the 'Rule of 70', the economy will double in size in approximately $\frac{70}{10} = 7$ years.

SCRATCH PAPER.