ECON 1010 Principles of Macroeconomics

Solutions to Midterm Exam #2

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Section 1: Multiple Choice (50 pts). Circle the correct answer; each is worth 2.5 points.

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1. Suppose that roughly 8 million people in the United States were actively seeking jobs but had not found them this month, the same number as last month. Suppose that 2 million of the people who were unemployed last month gave up their search this month and stopped looking for work. What will happen to the unemployment rate this month, all other things unchanged?

a) It will rise, because 2 million people are not in the labor force this month and are not counted as unemployed.
b) It will be unaffected, because the same number of people are unemployed.
c) The unemployment rate will decrease by 25 percent.
d) It will fall, because 2 million people are not in the labor force this month and are not counted as unemployed.

Table: Labor Force Data

Total population	200 million
Population age 16 and older	150 million
Employed	97 million

2. Using the data from the **Table: Labor Force Data**, suppose the labor force participation rate is 70 percent. The labor force is equal to:

a) 1200 million.
b) 400 million.
c) 105 million.
d) 50 million.

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3. An increase in the number of discouraged workers in the economy tends to:

a) lower the official unemployment rate.
b) lower the number of people who are frictionally unemployed.
c) increase the number of people who are structurally unemployed.
d) raise the official unemployment rate.

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4. In the absence of minimum wages, efficiency wages, or labor unions, a decline in the demand for labor will likely result in which if wages are flexible?

a) higher levels of employment.
b) lower level of employment and a higher unemployment rate
c) lower level of employment but likely no change in the unemployment rate
d) no changes in employment

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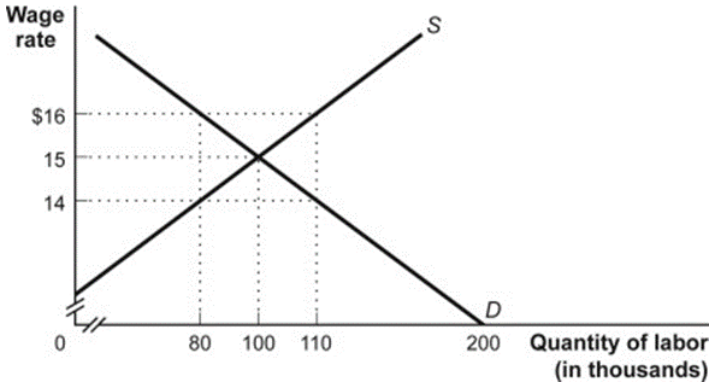
5. The deviations in the actual rate of unemployment away from the natural rate of unemployment is called:

a) cyclical.
b) seasonal.
c) structural.
d) frictional.



6. Refer to the labor market figure above. The size of the labor force at equilibrium wage rate is:

a) 80,000
b) 100,000
c) 200,000
d) 110,000

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7. Refer to the labor market figure above. What is the size of the labor force at an efficiency wage of $16?

a) 80,000
b) 100,000
c) 200,000
d) 110,000

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8. Over the past year, Eli has been working very hard. His employer has taken notice and is giving Eli a 6 percent raise in salary. During this past year, overall prices in the economy have increased by 4 percent. Given this information, Eli's real wage has:

a) decreased by 4 percent.
b) increased by 6 percent.
c) increased by 2 percent.
d) stayed constant.

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9. The inflation rate

a) is the annual rate of increase in the price level.
b) is always increasing when the overall price level is increasing.
c) is equal to the price level.
d) will be zero when prices are increasing at a constant rate.

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10. If the CPI for 2009 was 148.3 and for 2010 was 152.5, what was the inflation rate between the years?

a) 2.83 percent
b) 4.20 percent
c) 9.72 percent
d) 0.97 percent

Table: Market Basket of School Supplies

Good	Prices in 2010 (Base Year)	Quantity Bought (2010)	Prices in 2011
Backpack	$40	1,000	$50.00
Notebook	10	5,000	12.00
Highlighter	1	2,000	1.25

11. The **Table: Market Basket of School Supplies** shows the prices of three common school supplies in 2010 and 2011 and the quantities of each school supply that consumers bought in 2010, the base year. If we were to construct a school supply index (SSI) to measure the rate at which average school supply prices have changed, we would find an inflation rate of:

a) 122 percent
b) 18 percent
c) 22 percent
d) 82 percent

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12. Which government agency calculates the CPI?

a) Bureau of Labor Statistics
b) U.S. Treasury
c) Congress
d) Department of the Interior

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13. Which statement is FALSE?

a) The GDP deflator, the consumer price index, and the producer price index tend to move together over time.
b) The most widely used price index is the producer price index.
c) In the base year, the value of the price index is 100.
d) The producer price index fluctuates more than the GDP deflator or the consumer price index.

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14. Using the rule of 70, we can determine that, if real GDP per capita is growing at a rate of 2.5 percent per year, it will double in approximately _____ years.

a) 20
b) 28
c) 35
d) 15

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15. The term *human capital* describes improvement:

a) in a worker's skills made possible by education, training and knowledge.
b) in the technology available to the work force.
c) made possible by better machines and the equipment available.
d) in the robotics technology that can substitute for a human worker.

16. All are factors that drive productivity growth EXCEPT:

a) human capital.
b) growth convergence.
c) physical capital.
d) technological progress.

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17. The aggregate production function exhibits:

a) diminishing returns to physical capital.
b) increasing returns to physical capital.
c) negative returns to physical capital.
d) constant returns to physical capital.

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18. Growth accounting enables us to:

a) calculate the effects of technological progress on economic growth.
b) better calculate real GDP per capita.
c) calculate how long it takes the economy to grow.
d) compare growth rates across countries.

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19. Natural resources:

a) can be used to explain the differences in productivity growth among countries.
b) are still the most important factor in determining the productivity of human or physical capital for all countries.
c) are the only factor which consistently shows a positive impact on productivity for wealthy countries.
d) are a less significant source of productivity growth in most countries today than in earlier times.

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20. The convergence hypothesis helps explain why:

a) high-income countries continue their high growth rates.
b) high-income individuals marry other high-income individuals.
c) the income of high-income and lower-income countries get closer.
d) highly educated people converge in high-income countries.

Section 2: Short Answer Questions (50 pts).

1. (20 pts) Consider labor market data for the U.S. economy. All numbers are in millions of people.

Year	Population	Labor Force	Employed
2016	253	159	151
2017	255	160	153
2018	259	162	156

a) (10 pts) Calculate the labor force participation rate and unemployment rate for each of the three years above. Give two possible reasons for the trend in the labor force participation rate.

Solutions:

Unemployment rates: **2016:** $\boldsymbol{Unemp.Rates = \frac{8}{159} \times 100 = 5.0\%}$

2017: $\boldsymbol{Unemp.Rates = \frac{7}{160} \times 100 = 4.4\%}$

2018: $\boldsymbol{Unemp.Rates = \frac{6}{162} \times 100 = 3.7\%}$

Labor force part. rates: **2016:** $\boldsymbol{LFPR\ Rates = \frac{159}{253} \times 100 = 62.8\%}$

2017: $\boldsymbol{LFPR\ Rates = \frac{160}{255} \times 100 = 62.7\%}$

2018: $\boldsymbol{LFPR\ Rates = \frac{162}{259} \times 100 = 62.5\%}$

Labor force participation rates have been trending down since 2016. This could be due to the retirement of baby boomers or discouraged workers dropping out of the labor force.

b) (10 pts) Assume President Trump, in an effort to achieve 4% real GDP growth in 2019, gives a tax break to retirees if they "un-retire" and re-enter the labor force. As a result of the policy, assume 1 million retirees rejoin the labor force and immediately find a job. How will this new policy affect the labor force participation and unemployment rates? Defend your answer.

Solutions:

If 1 million retirees re-join the labor force and immediately find a job, the new unemployment rate in 2019 will decline slightly to:

Unemployment rates: **2019:** $\boldsymbol{Unemp.Rates = \frac{6}{163} \times 100 = 3.68\%}$

The new labor force participation rate will increase slightly to:

Labor force part. rates: **2019:** $\boldsymbol{LFPR\ Rates = \frac{163}{259} \times 100 = 62.9\%}$

2. (30 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 2016.

Year	Quantity Good X	Price per unit of X	Quantity Good Y	Price per unit of Y
2016	100	10	50	20
2017	120	12	40	25
2018	150	10	60	30

a) (10 pts) Calculate the GDP deflator for each of the three years in the table. What is the inflation rate between 2016 and 2017? Between 2017 and 2018?

Solutions:

Nominal GDP: 2016: $\boldsymbol{GDP = (100 \times \$10) + (50 \times \$20) = \$2000}$

2017: $\boldsymbol{GDP = (120 \times \$12) + (40 \times \$25) = \$2440}$

2018: $\boldsymbol{GDP = (150 \times \$10) + (60 \times \$30) = \$3300}$

Real GDP: 2016: $\boldsymbol{GDP = \$2000}$

2017: $\boldsymbol{GDP = (120 \times \$10) + (40 \times \$20) = \$2000}$

2018: $\boldsymbol{GDP = (150 \times \$10) + (60 \times \$20) = \$2700}$

GDP deflator: 2016: $\boldsymbol{GDP\ deflator = 100}$

2017: $\boldsymbol{GDP = \frac{\$2440}{\$2000} \times 100 = 122}$

2018: $\boldsymbol{GDP = \frac{\$3300}{\$2700} \times 100 = 122.22}$

Inflation Rate: 2016-17: $\boldsymbol{\pi = \frac{(122-100)}{100} \times 100 = 22\%}$

2017-18: $\boldsymbol{\pi = \frac{(122.22-122)}{122} \times 100 = 0.18\%}$

b) (10 pts) Assuming that a market basket for a typical consumer is given by five X and five Y (i.e., the quantity of X in the basket is X = 5 and the quantity of Y in the basket is Y = 5), calculate the CPI for each of the three years in the table. What is the inflation rate between 2016 and 2017? Between 2017 and 2018?

Solutions:

CPI: 2016: $CPI = \frac{(5\times\$10)+(5\times\$20)}{(5\times\$10)+(5\times\$20)} \times 100 = 100$

2017: $CPI = \frac{(5\times\$12)+(5\times\$25)}{(5\times\$10)+(5\times\$20)} \times 100 = \frac{\$185}{\$150} \times 100 = 123.33$

2018: $CPI = \frac{(5\times\$10)+(5\times\$30)}{(5\times\$10)+(5\times\$20)} \times 100 = \frac{\$200}{\$150} \times 100 = 133.33$

Inflation Rate: 2016-17: $\pi = \frac{(123.33-100)}{100} \times 100 = 23.33\%$

2017-18: $\pi = \frac{(133.33-123.33)}{123.33} \times 100 = 8.1\%$

c) (10 pts) President Trump recently nominated Stephen Moore to the Federal Reserve Board, the arm of the government that sets monetary policy and interest rates. Mr. Moore has been an outspoken critic of current Federal Reserve policy, claiming that interest rates have been set too high. Assume that Mr. Moore is confirmed to the Board, successfully lowers interest rates, and spurs more investment spending by companies. However, annual inflation unexpectedly jumps to 5%. What is the impact on nominal and real GDP? Also, list three long-run social costs of the 5% inflation.

Solutions:

Nominal GDP will increase because the price level will be higher and because there is more production. The increase in production comes from the investment spending by firms. Real GDP will increase because production will increase, holding prices constant.

Possible long-run social costs of inflation include …

- **Menu costs because businesses will need to pay to change their posted prices more frequently.**
- **Shoe leather costs because individuals will need to make more frequent financial transactions to make sure assets are invested in areas that keep up with inflation.**
- **Redistribution of wealth from lenders to borrowers.**
- **Tax distortions due to the fact that capital gains are not indexed to inflation.**
- **General inconvenience due to the need to devote more resources toward planning in an inflationary environment.**