Midterm 1

Name: Answer Key

Part I. Multiple Choice (20 points)

1. Choose the correct statement:

   A. Real GDP excludes the quantity effect from the data series
   B. To compare economic growth between countries, it is necessary to exclude the price effect from data
   C. Nominal GDP and real GDP data series never cross
   D. If nominal GDP increases by a lot, that means that the country becomes more economically developed

2. The purpose of the value added approach is:

   A. To illustrate how valuable every step of a production process is
   B. To eliminate double counting
   C. To add the value of all the materials used in the production process to the value of the final good

3. To compare economic performance of countries, it is best to use GDP data in:

   A. Real per capita terms
   B. Nominal per capita terms
   C. Real aggregate terms

4. Net exports increase when:

   A. Exports increase and imports increase
   B. Exports increase and imports decrease
   C. Investment increases
   D. Consumption expenditure increases

5. GDP basket does not include:

   A. A hockey stick that you order directly from Canada
   B. Party planning services from a company based in Hawaii
   C. Haircuts at the salon on Notre Dame campus
   D. Train carts produced in Michigan

6. What does the slope of the aggregate production function imply?

   A. Decreasing returns to scale
   B. Diminishing marginal product of capital
   C. Increasing returns to scale

7. Which of the following is a characteristic of an institution?

   A. Institutions have very little influence on a nation's economic prosperity
   B. The institutions of a nation are permanent and cannot be changed over time
   C. Institutions are determined by individual opinions without considering the government's preference
   D. Institutions place constraints on the behavior of economic agents

8. Choose the correct statement:

   A. It has been shown that poor countries are poor because of their unfortunate geographic locations
   B. It has been proved that poor countries are poor because of their cultural traditions and beliefs

C. There exists evidence that poor countries are poor because they have extractive economic institutions
D. Extractive economic institutions promote economic development

9. Which of the following statements is true of Malthus's theory?

A. Malthus suggested that fertility level of the population will remain constant over time
B. Malthus suggested that in the long run, income levels will grow exponentially
C. Malthus suggested that in the long run, income levels will stay at subsistence

10. Which of the following statements illustrates frictional unemployment?

A. Robin is quitting his current job to find another that has better prospects
B. Dave lost his job as he did not possess the technical skills required to do his duty
C. Many bank tellers lost their jobs due to the installation of ATM machines
D. Thousands of employees were laid off during the 2008-09 recession

11. An unemployed person:

A. May be a person who is employed at a job that does not use the skills they have accumulated at college or on previous jobs
B. Is not in the labor force
C. Wants work, has made specific efforts to find a job within the previous four weeks, or is waiting to be called back to a job from which he or she has been laid off, or is waiting to start a new job within 30 days
D. Can hold a part-time job and be searching for a full-time job

12. Choose the statement that is incorrect:

A. There can be some unemployment at full employment
B. At the natural unemployment rate, there is no cyclical unemployment
C. All unemployment at the natural unemployment rate is structural unemployment

13. An economy is at full employment when:

A. There is no cyclical unemployment
B. All unemployment is structural and cyclical
C. The unemployment rate is less than the natural unemployment rate
D. Al unemployment is cyclical

14. When the unemployment rate _____ the natural unemployment rate, real GDP _____ potential GDP.

A. is greater than; equals
B. equals; is less than
C. is greater than; is greater than
D. is greater than; is less than

15. If the annual interest paid on a $500 loan is $25, the nominal interest rate is _____ percent per year.
If the nominal interest rate is 5 percent per year and the inflation rate is 2 percent a year, the real interest rate is _____ per year.

A. 5; 7
B. 5; 3
C. 4; 4
D. 3; 5

Part II. True or False (20 points)

Record your answers on the scantron sheet.

16. Financial capital is the funds that firms use to buy physical capital.

    A. True B. False

17. Potential GDP is the quantity of the real GDP produced at full employment, which is a situation in which the unemployment rate equals the structural unemployment rate.

    A. True **B.** False

18. Value added is the value of output net of value of inputs.

    A. True B. False

19. Low, steady, and anticipated inflation is not a problem.

    A. True B. False

20. The real interest rate is approximately equal to nominal interest rate minus inflation rate.

    A. True B. False

21. The Consumer Price Index (CPI) is the most commonly used price index.

    A. True B. False

22. Labor force is the number of all employed people in the economy minus the number of all unemployed people in the economy.

    A. True **B.** False

23. If the nominal GDP per capita in a country is steadily increasing overtime, it means that the economy is improving.

    A. True **B.** False

24. Inclusive economic institutions protect property rights.

    A. True B. False

25. The best way to help poor countries become richer is to provide financial aid in the form of cash transfers to them.

    A. True **B.** False

Part III. Problems (60 points)

1. (15 points) Consider a student with the following monthly nominal expenditure and monthly nominal income:

Year	Tuition		Burgers		Nominal Income
	q	p	q	p	
2013	1	\$500	30	\$4.00	\$700
2014	1	\$520	30	\$4.50	\$700
2015	1	\$540	30	\$5.00	\$700

a) Pick a base year and identify what is in the CPI basket

Base year: 2013 (1 point)	**CPI basket: 1 unit of tuition and 30 burgers** (3 points)

b) Find the price level in each year (5 points):

$$CPI_t = \frac{\text{nominal basket cost}_t}{\text{basket cost in base year}}$$

$$CPI_{2013} = \frac{1 \cdot \$500 + 30 \cdot \$4.00}{1 \cdot \$500 + 30 \cdot \$4.00} = \frac{620}{620} = 100.00$$

$$CPI_{2014} = \frac{1 \cdot \$520 + 30 \cdot \$4.50}{1 \cdot \$500 + 30 \cdot \$4.00} = \frac{655}{620} = 105.65$$

$$CPI_{2015} = \frac{1 \cdot \$540 + 30 \cdot \$5.00}{1 \cdot \$500 + 30 \cdot \$4.00} = \frac{690}{620} = 111.29$$

2013: 100	**2014:** 105.65	**2015:** 111.29

c) Find the real income in each year (5 points):

$$W^{2012}_{2012} = W^{N}_{2012} \cdot \frac{CPI_{2012}}{CPI_{2012}} = \$700$$

$$W^{2012}_{2013} = W^{N}_{2013} \cdot \frac{CPI_{2012}}{CPI_{2013}} = \$700 \cdot \frac{100}{105.65} = \$662.50$$

$$W^{2012}_{2014} = W^{N}_{2014} \cdot \frac{CPI_{2012}}{CPI_{2014}} = \$700 \cdot \frac{100}{111.29} = \$628.99$$

2013: \$700	**2014:** \$662.50	**2015:** \$628.99

d) (1 point) In which year the student had the least ability to afford things?

2015

2. (20 points) Consider a country with the following data:

Year	Nominal GDP per capita	CPI
2012	\$910	95
2013	\$900	90
2014	\$920	102
2015	\$940	110

a) (10 points) Find *real* GDP per capita growth rate in 2013, 2014, and 2015:
First, find the real GDP per capita for each year:

$$Y_{2012}^{base} = Y_{2012}^{N} \cdot \frac{CPI_{base}}{CPI_{2012}} = \$910 \cdot \frac{100}{95} = \$957.89, \quad Y_{2013}^{base} = Y_{2013}^{N} \cdot \frac{CPI_{base}}{CPI_{2013}} = \$900 \cdot \frac{100}{90} = \$1000$$

$$Y_{2014}^{base} = Y_{2014}^{N} \cdot \frac{CPI_{base}}{CPI_{2014}} = \$920 \cdot \frac{100}{102} = \$901.96, \quad Y_{2015}^{base} = Y_{2015}^{N} \cdot \frac{CPI_{base}}{CPI_{2015}} = \$910 \cdot \frac{100}{110} = \$854.55$$

Now, find the growth rates:

$$g^{2013} = \frac{Y_{2013} - Y_{2012}}{Y_{2012}} \cdot 100 = \frac{1000 - 957.89}{957.89} \cdot 100 = 4.34\%$$

$$g^{2014} = \frac{901.96 - 1000}{1000} \cdot 100 = -9.80\%, \quad g^{2015} = \frac{854.55 - 901.96}{901.96} \cdot 100 = -5.26\%$$

2013: 4.34%	**2014:** -9.80%	**2015:** -5.26%

b) (3 points) Find the inflation rate in in 2013, 2014, and 2015:

$$\pi_{2013} = \frac{CPI_{2013} - CPI_{2012}}{CPI_{2012}} \cdot 100 = \frac{90 - 95}{95} \cdot 100 = -5.26\%$$

$$\pi_{2014} = \frac{102 - 90}{90} = 13.33\%, \quad \pi_{2015} = \frac{110 - 102}{102} = 7.84\%$$

2013: -5.26%	**2014:** 13.33%	**2015:** 7.84%

c) (5 points) What will real GDP per capita be in 2050 if starting 2015 the economy experiences a constant growth of 0%, 1% and 3%?
Use formula for exponential growth: $X_{t+n} = X_t(1+g)^n$
If growth is 0%: $Y_{2050} = Y_{2015} \cdot (1+0.00)^{35} = \$854.55 \cdot (1.00)^{35} = \$854.55$
If growth is 1%: $Y_{2050} = Y_{2015} \cdot (1+0.01)^{35} = \$854.55 \cdot (1.01)^{35} = \$1,210.55$
If growth is 3%: $Y_{2050} = Y_{2015} \cdot (1+0.03)^{35} = \$854.55 \cdot (1.03)^{35} = \$2,404.57$

0%: \$854.55	**1%:** \$1,210.55	**3%:** \$2,404.57

d) What would lead this country to experience sustained (constant) growth from 2015 to 2050 (think about aggregate production function)?

technological progress (2 points)

3. (15 points) Consider a country with the following data for 2013:

	Millions of people
Population	300
Working-age population	280
Labor force	250
Employed	200
Unemployed	?

a) (5 points) Find the unemployment rate (UR), employment-to-population ratio (EPR) and the labor force participation rate ($LFPR$):

The number of unemployed persons = number in labor force - number employed = 250-50 = 50 million

$$UR = \frac{unemployed}{labor\ force} \cdot 100 = \frac{50}{250} \cdot 100 = 20\%$$

$$EPR = \frac{employed}{working\ age\ population} \cdot 100 = \frac{200}{280} \cdot 100 = 71.43\%$$

$$LFPR = \frac{labor\ force}{working\ age\ population} \cdot 100 = \frac{250}{280} \cdot 100 = 89.29\%$$

UR: 20%	EPR: 71.43%	$LFPR$: 89.29%

b) (8 points) Imagine that in 2014 population, working-age population, and the number of people employed does not change from 2013 values but the labor force grows by 5%. Find the unemployment rate (UR), employment-to-population ratio (EPR) and the labor force participation rate ($LFPR$) for 2014:

First, calculate the new value for the labor force:

$$LF_{2014} = LF_{2013} \cdot (1 + g) = 250 \cdot 1.05 = 262.5$$

The number of unemployed persons in 2014 is:

$$U_{2014} = LF - E = 262.5 - 200 = 62.5$$

Now we have all the data to calculate our labor market indicators:

$$UR = \frac{unemployed}{labor\ force} \cdot 100 = \frac{62.5}{262.5} \cdot 100 = 23.81\%$$

$$EPR = \frac{employed}{working\ age\ population} \cdot 100 = \frac{200}{280} \cdot 100 = 71.43\%$$

$$LFPR = \frac{labor\ force}{working\ age\ population} \cdot 100 = \frac{262.5}{280} \cdot 100 = 93.75\%$$

UR: 23.81%	EPR: 71.43%	$LFPR$: 93.75%

c) How did every indicator change from 2013 to 2014 (increased, decreased, no change) (2 points)?

UR: increased	EPR: no change	$LFPR$: increased