Name: ________________________________

You have 50 minutes to complete the 100 points worth exam. Make sure you show all your work so you can get partial credit. If you get stuck in a problem, make an assumption (*reasonable*), indicate it clearly, and continue with the problem. **Before beginning the exam, please verify that you have 7 pages with 22 questions in your exam booklet.** Good luck!

**Multiple Choice (each 3 points)**

1. In 2016, the GDP of the United States totaled about:
   a. $110 billion.
   b. $11 trillion.
   c. $574 billion.
   d. $19 billion.
   e. $19 trillion.

2. During the period between 1900 and 2012, the unemployment rate in the United States was highest in the:
   a. 1920s.
   b. 1930s
   c. 1970s.
   d. 1980s.
   e. 2010s.

3. According to the neoclassical theory of distribution, if firms are competitive and subject to constant returns to scale, total income in the economy is distributed:
   a. between the labor and capital used in production, according to their marginal productivities.
   b. equally between the labor and capital used in production.
   c. partly between labor and capital used in production, with the surplus going to the owners of the firm as profits.
   d. only to the labor used in production.
   e. only to capital used in production.

4. If the productivity of farmers has risen substantially over time because of technological progress, and workers can move freely between being farmers and barbers, the neoclassical theory of distribution predicts that the real wage(s) of:
   a. farmers should have risen while the real wage of barbers should have decreased.
   b. farmers should have risen while the real wage of barbers should have remained constant.
   c. barbers should have risen while the real wage of farmers should have remained constant.
   d. both barbers and farmers should have risen over time.
   e. both barbers and farmers should have remained constant over time.
5. The investment component of GDP includes all of the following except:
   a. spending on new plants.
   b. changes in business inventories.
   c. purchases of corporate stock.
   d. purchases of new housing by households.
   e. spending on equipment.

6. The natural rate of unemployment in the United States since 1952 has averaged between _____ and _____ percent.
   a. 0; 1
   b. 5; 6
   c. 1; 3
   d. 2; 11
   e. 10; 15

7. If disposable income is 4,000, consumption is 3,500, government spending is 1,000, and tax revenues are 800, national saving is equal to:
   a. 1,000
   b. 700
   c. 500
   d. -500
   e. 300

8. If an earthquake destroys some of the capital stock, the neoclassical theory of distribution predicts:
   a. both the real wage and the real rental price of capital will rise.
   b. the real wage will rise and the real rental price of capital will fall.
   c. the real wage will fall and the real rental price of capital will rise.
   d. the real wage will remain the same and the real rental price of capital will rise.
   e. the real wage will remain the same and the real rental price of capital will fall.

9. Evidence from the past 40 years in the United States supports the Fisher effect and shows that when the inflation rate is high, the _____ interest rate tends to be ______.
   a. nominal; low
   b. real; high
   c. real; low
   d. nominal; high
   e. real interest rate tends to be high, while the nominal; low

10. If the real return on government bonds is 3 percent and the expected rate of inflation is 4 percent, then the cost of holding money is ______ percent.
    a. 7
    b. 4
    c. 1
    d. 3
    e. -1
11. Which of the following is the best example of structural unemployment?
   a. Fatima lost her job at a packing plant, but has not looked very intensively for a new job because she still has two months of unemployment insurance benefits left.
   b. Vickie lost her job as a graphic artist at a movie studio because she did not have training in computer-generated animation.
   c. Tim is looking for a job with flexible hours, but has not been offered one yet.
   d. Mark lost a job in coal mining as demand for coal decreased due to a changing structure of the economy and a switch from fossil fuels to renewable sources of energy.
   e. Kirby is seeking a job as an airline pilot, but the high union wages in the industry have limited the number of jobs available.

12. In the neoclassical model with fixed income, if there is a decrease in taxes with no change in government spending, then public saving ______ , private saving ______ , and national saving ________________.
   a. decreases; increases; increases
   b. increases; increases; does not change
   c. decreases; increases; decreases
   d. decreases; does not change; decreases
   e. increases; increases; decreases

13. All of the following actions increase government purchases of goods and services except the:
   a. city of Delaware's buying a new snow plow.
   b. federal government's sending a paycheck to Sherrod Brown, a US Senator from Ohio.
   c. federal government's sending a paycheck to Mika Jones, a US Army captain.
   d. federal government's sending an unemployment insurance check to Zach Green.
   e. the state of Ohio’s repairing bridges across the state.

14. The CPI is determined by computing:
   a. the price of a basket of goods and services that changes every year, relative to the same basket in a base year.
   b. the price of a fixed basket of goods and services, relative to the price of the same basket in a base year.
   c. nominal GDP relative to real GDP.
   d. an average of prices of all goods and services.
   e. a change in inflation.

15. In Albania, the velocity of money is constant, real GDP grows at 4 percent per year and the money supply grows at 6 percent per year. According to the quantity theory of money, what is the rate of inflation in Albania?
   a. 5 percent
   b. 4 percent
   c. 3 percent
   d. 2 percent
   e. 1 percent
Short Answers

16. **Key Concepts** (8 points) Explain the following terms:
   a. National Income Accounting Identity
   b. Loanable funds
   c. Seigniorage
   d. Open-market operations

17. **Inflation** (8 points) Milton Friedman said, "Inflation is always and everywhere a monetary phenomenon." Thomas Sargent said, "Inflation is always and everywhere a fiscal phenomenon." Explain how both statements can be true. *(Hint: Your answer should include a discussion of a government's requirement for seigniorage.)*
18. **CPI and GDP deflator (6 points)** There are a number of statistics computed to measure the price level, such as the GDP deflator and the CPI. The choice of which of these measures to use depends in many cases on the specific question in which you are interested. For each of the following situations, state whether the CPI or GDP deflator is a more appropriate measure to use and explain why the statistic is preferred.

   a. You are interested in looking at the impact of higher prices of imported oil in the overall cost of living.

   b. The government is interested in whether increases in defense spending are affecting the price level.

   c. An economic consulting firm is investigating the impact on the aggregate price level of more computers and electronic technology used in production.

19. **Cobb-Douglas (8 points)** Assume that the production function is given by $Y = AK^{0.5}L^{0.5}$, where $Y$ is GDP, $K$ is capital stock, and $L$ is labor. Assume that the productivity parameter $A$ is equal to 20, capital is 400, and labor is 900.

   a. (2 points) What is the value of $Y$?

   b. (2 points) What is the share of total income going to labor?

   c. (2 points) What is the real rental price of capital?

   d. (2 points) What would happen to the real wage and the real rental rate of capital if the economy all of a sudden experiences an influx of foreign workers?
20. **Unemployment** *(10 points)* The adult population in the United States in January 2013 was 244.6 million people, the labor force was 155.6 million, and total employment was 143.3 million. In the long-run, 3% of all the employed workers in the United States get separated from their jobs, while 50% of the unemployed find a job.

a. *(2 points)* What was the unemployment rate in the United States in January 2013?

b. *(2 points)* What was the labor force participation rate in the United States in January 2013?

c. *(2 points)* What is the natural rate of unemployment in the United States?

d. *(2 points)* If the Unites States government feels that the natural rate of unemployment is too high, propose a policy that would lower frictional unemployment.

e. *(2 points)* Suppose Congress raised the federal minimum wage from $7.25 to $10.10. Explain what such an increase would do. **Use a graph.**
21. **GDP (10 points)** Explain why the value of GDP in 2016 would or would not change as a result of each transaction described below:

a. In 2016, the Smith family purchases a new house that was built in 2016.

b. In 2016, the Jones family purchases a house that was built in 2001.

c. In 2016, a construction company purchases windows to put in the Smith family home that was built in 2016.

d. In 2016, Mr. Jones paints all of the rooms of the Jones family house purchased in 2016.

e. In 2016, Mr. Smith uses an online brokerage service to purchase shares of stock in a construction company.

22. **Expectations (5 points)** If the Fed announces that it will raise the money supply in the future but does not change the money supply today, what happens to the economy today, if anything? Explain.

**Extra Credit**

If you have not missed more than one class since the beginning of the semester, you can answer the question below and earn 3 points extra credit.

23. GDP is the market value of all ______ goods and services produced within an economy in a given period of time.

a. consumer  
b. final  
c. intermediate  
d. used  
e. final and intermediate
KEY

1. E  
2. B  
3. A  
4. D  
5. C  
6. B  
7. E  
8. C  
9. D  
10. A  
11. E  
12. C  
13. D  
14. B  
15. D

16.a. National Income Accounting Identity: \( Y = C + I + G + NX \). This identity states that total output (\( Y \)) equals total spending by all the groups in the economy (\( C+I+G+NX \)).

16.b. Loanable funds: These are funds that are made available by the savers (households and the government) for the use as investment (by businesses and households (for housing purchases)). The price of loanable funds is the real interest rate, or \( r \).

16.c. Seigniorage: Income generated from printing money. A government could potentially raise revenue by printing money. When it does that, any income such a government receives is called seigniorage.

16.d. Open-market operations: buying and selling of Treasury bonds by the Federal Reserve. When the Fed wants to insert money into the economy, it buys bonds from the public and pays for them with money, hence, new money is in the economy. If the Fed wants to reduce the money supply, they would sell bonds to the public and store money in its vault.

17. The statement ``inflation is always and everywhere a monetary phenomenon'' is true because inflation comes from the growth of the money supply. According to the quantity theory, \( \Delta M + \Delta V = \Delta P + \Delta Y \), so if the money supply (\( M \)) grows faster than real output (\( Y \)), this is translated into higher prices (\( P \)), which means inflation.

The statement ``inflation is always and everywhere a fiscal phenomenon'' is also true because the root cause of inflation lies in the reason of why the money supply grows faster than real output. What usually happens is that the government runs into fiscal problems and faces a budget deficit. Instead of being fiscally responsible by either decreasing government expenditure or increasing taxes, the government opts of an easier (at least in the short-run) solution by printing money to cover the budget deficit. And this phenomenon of printing money to cover the fiscal deficit is known as seigniorage.
18.a. The CPI is the more appropriate statistic, because the price of imports is not included in the GDP deflator.
18.b. The GDP deflator is the more appropriate statistic, because the CPI does not include the prices of goods and services purchased by the government sector.
18.c. The GDP deflator is more appropriate, because the CPI does not include prices of goods and services purchased by businesses or the government sector.

19.a. 12,000
19.b. 50% or 6,000
19.c. 15
19.d. The real wage would decrease and the real rental rate or capital would increase.

20.a. 7.9%
20.b. 63.6%
20.c. 5.7
20.d. lower unemployment benefits
20.e. An increase in the federal minimum wage rate would increase structural unemployment. Suppose that the labor supply is L and labor demand is represented by the MPL. If the minimum wage is at $7.25, labor demand is L1 and there is unemployment L-L1. If the minimum wage increases to $9, the quantity of labor demand decreases to L2 and the level of unemployment increases to L-L2.

21.a. GDP in 2009 increases by the purchase price of the house, which is a newly produced good.
21.b. GDP in 2009 does not change because the house is not a newly produced good, since it was built in 2001. Transactions involving used goods are not included in GDP.
21.c. GDP in 2009 does not change directly because the windows are intermediate goods, not final goods. The value of intermediate goods is not included in GDP to avoid double counting. The value of the windows is implicitly included in the price of the house.

21.d. GDP in 2009 does not change because home production is not included in GDP.

21.e. GDP in 2009 does not change because financial transactions do not represent the production of final goods and services and are not included in GDP.

22. Since the Fed announces it will increase the money supply, people start expecting inflation. As inflation expectations increase, due to the Fisher effect, nominal interest rates rise (recall that \( r = \text{MPK} \)). Given that the nominal exchange rate increases, this means that demand for real money balances decreases. Recall that the interest rate is the opportunity cost of holding money, so if the interest rate increases, it becomes more expensive to hold money in your pocket, so you want to keep less of it in your pockets. Since demand for real money balances decreased and there is no formal action from the Fed via the monetary policy \((M = M)\), the only way supply of real money balances can decrease is if prices increase. Thus, prices in the economy increase to bring the economy back to the equilibrium where demand for real money balances equals supply of real money balances.

23. B