Final Exam (Sample)

Friday, May 21

1 hour, 30 minutes

Name: ________________________________

Instructions

1. This is closed book, closed notes exam.
2. No calculators and electronic devices of any kind are allowed.
3. Show all the calculations.
4. If you need more space, use the back of the page.
5. Fully label all graphs.
6. The last page contains a few formulas.

Good Luck 😊
1. The next figure illustrates the Production Possibilities Frontier of Pandora (a country).

![PPF of Pandora](image)

a. An output of 60 guns and 70 roses is (circle the correct answer):
   i. Attainable and inefficient
   ii. Attainable and efficient
   iii. Unattainable and inefficient
   iv. Unattainable and efficient

b. Suppose that Pandora initially produces at point A, and considers producing 30 more guns (i.e. moving to point B) in anticipation for an attack by a neighboring country named Earth. The opportunity cost of this move is:
   i. 20 guns
   ii. 70 guns
   iii. 20 roses
   iv. 70 roses

c. Suppose that new technology was developed which allows producing more guns with any given inputs. Draw the new PPF on the above graph, and label it “c”.

d. Suppose that climate change in Pandora decreased the output of roses for any given inputs. Draw the new PPF on the above graph, and label it “d”.

1
2. (10 points). The next table presents data from the National Income and Product accounts of some country.

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personal Consumption Expenditures</td>
<td>6,000</td>
</tr>
<tr>
<td>Gross Investment</td>
<td>2,000</td>
</tr>
<tr>
<td>Government Consumption Expenditures</td>
<td>1,500</td>
</tr>
<tr>
<td>Net Exports</td>
<td>500</td>
</tr>
<tr>
<td>Compensation of Employees</td>
<td>5,000</td>
</tr>
<tr>
<td>Net Interest</td>
<td>1,000</td>
</tr>
<tr>
<td>Rental Income</td>
<td>500</td>
</tr>
<tr>
<td>Profit</td>
<td>2000</td>
</tr>
<tr>
<td>Indirect business tax net of subsidies</td>
<td>500</td>
</tr>
<tr>
<td>Depreciation</td>
<td>950</td>
</tr>
<tr>
<td>Statistical Discrepancy</td>
<td>50</td>
</tr>
</tbody>
</table>

a. Based on the above data calculate the GDP of this country using the expenditure approach.

b. Calculate the GDP using the Income approach.

c. A person buys a new imported car. This transaction will be recorded in the NIPA as part of:
   i. Consumption only
   ii. Imports only
   iii. Consumption and Imports
   iv. Investment and imports
3. Consumer Price Index (CPI) at the end of 2009 was 200, and at the end of 2010 the CPI was 219.
   a. Calculate the inflation rate in 2010.

   b. Suppose that Carla earned $100,000 in 2009 and in 2010, realized that her salary is not keeping up with rising cost of living, and asked her boss for a raise. How much raise (in $) would Carla need in 2010, so that her real wage stays the same as in 2009?

   c. Suppose that Carla has a savings account that pays 5% nominal interest rate. What was the real interest rate that Carla earned on her savings in 2010?
4. (10 points). The following table contains data from the labor market of some country (in millions).

<table>
<thead>
<tr>
<th>Civilian noninstitutional population</th>
<th>100</th>
</tr>
</thead>
<tbody>
<tr>
<td>Civilian labor force</td>
<td>70</td>
</tr>
<tr>
<td>Employed</td>
<td>63</td>
</tr>
<tr>
<td>Unemployed</td>
<td></td>
</tr>
<tr>
<td>Not in the labor force</td>
<td></td>
</tr>
</tbody>
</table>

a. Complete the above table.

b. Find the unemployment rate in this country.

c. Find the labor force participation rate in this country.

d. Mathew is 17 years old who finished high school and started looking for a job, but was unable to find one. This event creates
   i. Frictional unemployment
   ii. Structural unemployment
   iii. Seasonal unemployment
   iv. Cyclical unemployment
5. Suppose that the economy of Haiti is described by the macroeconomic model consisting of a production function and a labor market.
   a. Suppose that a large amount of capital in Haiti was destroyed by an earthquake. Illustrate the impact of the earthquake on the Haitian potential real GDP, equilibrium real wage and employment.
b. Repeat part a, but now assume that the earthquake also killed many people, in addition to destroying physical capital.
6. Suppose that during 2005, real GDP increased by 3% and the population growth rate was 2%.
   a. What is the growth rate in standard of living?

   b. Using the rule of 70, approximately how many years will it take for the real GDP to double?

   c. Using the rule of 70, approximately how many years will it take for the standard of living to double?

   d. Draw a graph of a county’s production function and illustrate the effect of a technological change.

Production function
7. Using the diagram of a loanable funds market, illustrate the **crowding out effect** of an increase in government deficit. State what happens to the equilibrium real interest rate and equilibrium investment. **Assume no Ricardo-Barro effect.**
8. Suppose that the public wants to hold currency/deposit ratio of \( cd = 0.2 \), and the required reserve/deposit ratio is \( rd = 0.1 \). The initial consolidated balance sheet of commercial banks is:

<table>
<thead>
<tr>
<th>Assets</th>
<th>Liabilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>( R = 5 )</td>
<td>( D = 50 )</td>
</tr>
<tr>
<td>( B_G = 15 )</td>
<td>( K = 10 )</td>
</tr>
<tr>
<td>( L = 40 )</td>
<td>( 60 )</td>
</tr>
</tbody>
</table>

Where \( R \) is reserves, \( D \) is demand deposits, \( B_G \) are government bonds, \( L \) denotes loans, and \( K \) denotes the shareholder’s equity (capital).

a. Find the monetary base, the money supply and the money multiplier in this economy.

b. (5 points). If the central bank increases the monetary base by $100, the money supply will increase by $_______ (write your answer in the blank space).
c. Present a balance sheet of a bank that experiences **Balance Sheet Insolvency**.

d. Suppose that real GDP in China is growing at 7% per year, and the velocity of circulation is constant. Using the **quantity theory of money**, find the necessary growth rate of the money supply in order to achieve inflation rate of 2% per year.
9. Using the AS-AD model,
   a. illustrate an economy in recession, and indicate the recessionary gap.

   AS-AD

   ![AS-AD Graph]

   b. Illustrate on the above graph, an *expansionary* fiscal policy which successfully ends the recession.

   c. Suppose that the size of the recessionary gap is 1000, and the government expenditure multiplier is 2. What should be the size of the fiscal stimulus, which will end the recession and will restore full employment?
Formulas

I. NIPA:
   1. GDP expenditure approach: $GDP = C + I + G + \frac{X - IM}{NX}$
   2. GDP income approach ($GDI$):
      a. $NDP_f = W + Int + Rent + \pi$ (Net Domestic Product at factor cost)
      b. $GDI = NDP_f + T_i + Dep$
   3. $GDP = GDI + SD$ (how the two measures compare).

II. Money:
   1. $MB = CU + R$ (monetary base)
   2. $M = CU + D$ (money supply)
   3. $mm = \frac{cd + 1}{cd + rd}$ (money multiplier)
   4. $MV = PY$ (quantity equation in levels)
   5. $\hat{M} + \hat{V} = \hat{P} + \hat{Y}$ (quantity equation in approximate growth rates)