Economics 102   Name _____
Quiz #3
Thursday, June 15, 2017

Write all answers legibly and clearly. Show your work to get full credit on this quiz.

1. (4 points total) Suppose you are told that the aggregate production function for an economy can be expressed as follows where Y is real GDP, L is the number of units of labor, and K is the number of units of capital:

Aggregate Production Function: $Y = 2K^{1/2}L^{1/2}$

You are also told that capital is equal to 25 units in this economy.

Suppose that the labor market is described by the following equations where w is the wage rate:

Demand for Labor: $L = 100 - (5/2)w$
Supply of Labor: $L = 2w - 35$

a. (1 point) Given the above information, what are the equilibrium wage rate and the equilibrium quantity of labor? Show your work.

Answer:

$100 - (5/2)w = 2w - 35$
$200 - 5w = 4w - 70$
$270 = 9w$
w = $30 per unit of labor
$L = 100 - (5/2)(30) = 100 - 75 = 25$ units of labor
Or, $L = 2(30) - 35 = 60 - 35 = 25$ units of labor

b. (1 point) Given the above information, what is the value of real GDP in this economy? Show your work.

Answer:
real GDP = $Y = 2*5*5 = 50$ units of output

c. (1 point) Given the above information, what is the value of labor productivity for this economy? Provide any formula or definition that you use in getting your answer. Make sure your answer includes units of measurement to get full credit!

Answer:
Labor Productivity = real GDP/labor = Y/L = (50 units of output)/(25 units of labor) = 2 units of output per unit of labor

1

d. (1 point) Given the above information, what is the value of capital productivity for this economy? Provide any formula or definition that you use in getting your answer. Make sure your answer includes units of measurement to get full credit!
Answer:
Capital Productivity = real GDP/capital = Y/K = (50 units of output)/(25 units of capital) = 2 units of output per unit of capital

2. (4 points total) Suppose that for purposes of constructing the CPI that the market basket is defined as three pencils and 2 hamburgers. You are provided the following information:

Year	Price Per Pencil	Price Per Hamburger
2014	$1	$3
2015	$1	$4
2016	$2	$3

a. (1 point) Compute the cost of the market basket in the three years. Place your answers in the table below.

Year	Cost of Market Basket
2014	
2015	
2016	

Answer:

Year	Cost of Market Basket
2014	(3 pencils)($1 per pencil) + (2 hamburgers)($3 per hamburger) = $9
2015	(3 pencils)($1 per pencil) + (2 hamburgers)($4 per hamburger) = $11
2016	(3 pencils)($2 per pencil) + (2 hamburgers)($3 per hamburger) = $12

b. (1 point) Using 2015 as the base year, compute the CPI index number for each year. Use a 100 point base for the CPI. Show your work. Then, put your final answers in the table below. Round your answers to the nearest whole number.

Year	CPI with base year 2015 and 100 point scale
2014	
2015	
2016	

Answer:

Year	CPI with base year 2015 and 100 point scale
2014	(9/11)(100) = 82
2015	(11/11)(100) = 100
2016	(12/11)(100) = 109

To find a CPI index number use the formula:
CPI for year n = [(Cost of Market Basket in year n)/(Cost of Market Basket in base year)](scale factor)

c. (1 point) Using 2014 as the base year, compute the CPI index number for each year. Use a 100 point base for the CPI. Show your work. Then, put your final answers in the table below. Round your answers to the nearest whole number.

Year	CPI with base year 2014 and 100 point scale
2014	
2015	
2016	

Answer:

Year	CPI with base year 2014 and 100 point scale
2014	(9/9)(100) = 100
2015	(11/9)(100) = 122
2016	(12/9)(100) = 133

To find a CPI index number use the formula:
CPI for year n = [(Cost of Market Basket in year n)/(Cost of Market Basket in base year)](scale factor)

d. (1 point) Calculate the annual rate of inflation based upon the CPI index numbers you created. Does it matter whether you use the CPI numbers from (b) or (c) to do your calculation? Provide the annual rate of inflation in the table below and a short explanation in the space provided. Round your answer to the nearest whole number.

Year	Annual Rate of Inflation using CPI
2014	
2015	
2016	

Answer:

Year	Annual Rate of Inflation using CPI with base year 2015
2014	---
2015	[(100 -82)/82](100%) = 22%
2016	[(109 – 100)/100](100%) = 9%

Year	Annual Rate of Inflation using CPI with base year 2014
2014	---
2015	[(122 – 100)/100](100%) = 22%
2016	[(133 – 122)/122](100%) = 9%

The index numbers for the CPI will be different with a different choice of base year. But, the annual rate of inflation as measured by the CPI is not sensitive to choice of base year. So, it does not matter whether you use the CPI numbers from (b) or (c) in doing this calculation.

3. Consider the loanable funds framework. Suppose that the loanable funds market is initially in equilibrium and that the government is initially running a balanced budget and that the economy is closed to trade.

a. (1 point) In a graph illustrate the loanable funds market in this initial equilibrium. Identify the equilibrium interest rate as r_1, the equilibrium level of investment spending as I_1, and the equilibrium level of saving as S_1. Label all curves and axis on your graph.

Answer:
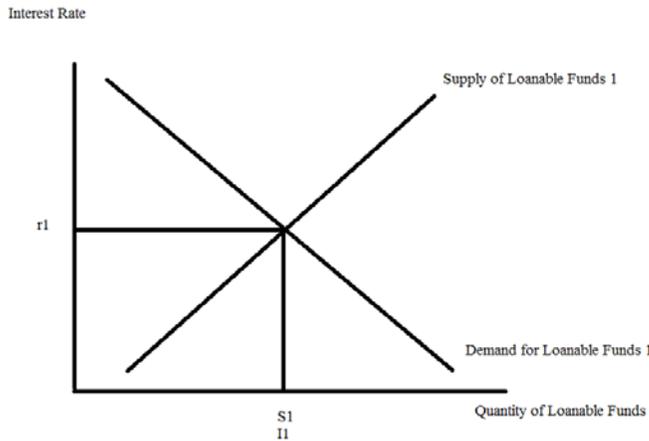
b. (1 point) In the same graph indicate how opening up trade with foreign countries (assume the economy would import more than it exports) would alter this graph. Clearly illustrate the new equilibrium interest rate as r_2, the new equilibrium level of investment spending as I_2, and the new equilibrium level of saving as S_2. Label all curves and axis on your graph.

Answer: