Carnegie Mellon Tepper SCHOOL OF BUSINESS

73-240 – Practice Problems

Sample Short Questions

Question 1:

The current price of a Big Mac is $4.33. Suppose McDonald's imports $2.30 worth of meat, buns, and cheese. The cost of labor is $1.00 per Big Mac. What is the contribution of this one Big Mac to GDP when measured by the product approach?

Question 2:

List 3 ways in which the CPI may overstate inflation

Question 3:

Consider the household who has h hours of time that it can use towards either leisure or labor supplied. There is no lump-sum tax levied on the household and dividends are positive. In addition, the household faces a proportional tax on its consumption expenditure. Draw the household budget constraint. Label your axes and all intercepts clearly. On your graph, also write down what the slope of the budget constraint is.

Question 4

Consider the following production function. $Y = aK + (1-a)N$ where Y = output, K = capital and N = labor. a is a parameter that takes values between 0 and 1. Answer the following statement: are capital and labor complements? Justify your answer by showing how MPN changes with one additional unit of K

Question 5:

Suppose you are told that $Y = zN$ and $G = 0$. Graph a competitive equilibrium. Label all axes and intercepts clearly on your graph.

Question 6:

Consider the government's problem. It has to finance exogenous spending G. It chooses to do so by collecting a proportional tax on the firm's wage bill (i.e. it taxes the firm for

every worker it pays). Write down what the firm's problem looks like. Write down what the government budget constraint looks like.

Question 7:

Suppose we have the following information. Suppose the government in economy A always balances its budget. Let total tax revenue be 10. Let business fixed investment be 20 and the value of imports is 25. Consumption spending is 40 and GDP is 75. Find the value of exports

Question 8:

Explain why labor productivity Y/N increases when total factor productivity increases. You may assume a Cobb-Douglas Production Function.

Sample Long Questions

Problem 1: Keeping Up With the Jones

Suppose the household in our economy is one who is only happy if it gets to consume more consumption goods than the average consumer. In other words, our household gets utility from relative consumption. Specifically assume:

$$U(c, l) = \ln(c) - B \ln \bar{c} + \ln l$$

where $\bar{c} = \frac{1}{M} \sum_{m \in M} c_m$ is the average consumption and M is the total population, m refers to 1 individual in that population. Assume that there is no government spending and households receive a real wage w for each unit of labor supplied. Households also receive dividend income π.

i State the household choice variables

ii Set-up the household problem

iii Characterize the household's optimality conditions.

Problem 2: Keeping Up With the Jones pt 2

Continuing from problem 1, suppose the firm in the economy produces output according to $Y = zK^{\alpha}N^{1-\alpha}$

i Set-up the firm's problem and characterize its optimality condition.

ii Solve for optimal consumption and labor used in the competitive equilibrium.

Problem 3: Keeping Up With the Jones pt 3

Continuing from problem 1 and 2, suppose we now consider the Social planner's problem. Since the social planner has control over the whole economy. It recognizes that it can control average consumption together with individual consumption. Further the social planner understands that with identical households,

$$\bar{c} = \frac{1}{M} \sum_{m \in M} c_m = \frac{1}{M} Mc = c$$

Given the same production function as in problem 2 and the same utility function as in problem 1.

i Set-up the social planner's problem and characterize its optimality conditions.

ii Solve for optimal consumption and labor in the social planner's problem

iii Is the competitive equilibrium outcome that you derived in problem 2 pareto optimal?