

### EE211 HW Assignment 1 (Semester 1/2015)

1. Suppose that you are a high school student who must make decisions whether to pursue bachelor's degree or to enter the labor market to find a job. The bachelor's degree in Economics at University T is a 4-year program and that each year you spend ₦120,000, assuming that all learning materials are provided by the university. Company C in the labor market offers you with a 4-year contract that guarantees annual earnings of ₦180,000 per year, but you are required to spend ₦60,000 on clothes (over the 4 years).
  - a. What is the opportunity cost of attending University T?
  - b. Suppose that living expenses over 4 years is ₦240,000. **Regardless of the final decision you will make**, what is the opportunity cost of attending University T?
  - c. What will be your final decision? Please state your reasons (Note: There is no wrong answer for this question. You will receive full credit if you answer with reasons to support your answer!)
2. A university produces two commodities: Research and teaching. The resource the university uses includes faculty and staff, libraries, classroom and so on. The following table indicates some point on the university's PPC:

| Combination | Value of Output |          |
|-------------|-----------------|----------|
|             | Research        | Teaching |
| A           | 900             | 0        |
| B           | 750             | 20       |
| C           | 600             | 45       |
| D           | 450             | 75       |
| E           | 300             | 110      |
| F           | 150             | 150      |
| G           | 0               | 200      |

- a. State necessary assumptions for PPC. Suggest possible circumstances that the outputs would not lie on the PPC.
- b. Draw PPC with the information given on the table. Plot "Teaching" on the horizontal axis and "Research" on vertical axis.
- c. Illustrate which areas of the graph correspond to unattainable production points, production points that make the most effective use of the university's resource, and points where there are unemployed resource
- d. Calculate the opportunity of producing additional unit of research. Suppose that the university is at point B but would like to alter production to point C, what would be the per-teaching-unit opportunity cost of producing the extra research? Does research production be the university exhibit increasing, constant, or decreasing per-unit opportunity costs?
- e. What will happen to the university's PPC if the main laboratory burns down (assume that the laboratory is not used to produce teaching but is used solely to produce research)? Graph the new PPC.
- f. Suppose the university is at point F. The university president proposes to move the production to point B; she claims that B is more desirable choice since the total output is  $720+20=770$  unit of output at B versus  $150+150=300$  output unit at F. Is the president correct?

3. During summer, you want to earn some extra money, so you decide to grow tomatoes and sell them to farmers in the market for ₱0.30 per kilogram. By adding compost to your garden, you can increase your production as shown in the table below:

| Kilograms of compost | Kilograms of tomatoes |
|----------------------|-----------------------|
| 0                    | 100                   |
| 1                    | 120                   |
| 2                    | 125                   |
| 3                    | 128                   |
| 4                    | 130                   |
| 5                    | 131                   |
| 6                    | 131.5                 |

- a. If compost costs ₱0.50 per kilogram, and your objective is to maximize your profit. Assuming that there are no other costs, at what level of tomatoes will you choose to produce?
- b. Does the answer in question a. satisfy the concept of duality that has been discussed in class? Why? Please state your reasons.