

UNIVERSITY OF ESWATINI
FACULTY OF SOCIAL SCIENCES
DEPARTMENT OF ECONOMICS

MAIN EXAMINATION PAPER: DECEMBER 2018

TITLE OF PAPER: HEALTH ECONOMICS

COURSE CODE: ECO423

TIME ALLOWED: 2 HOURS

INSTRUCTIONS TO CANDIDATES

- 1. ANSWER ANY FOUR QUESTIONS**

**DO NOT OPEN THIS PAPER UNTIL YOU ARE INSTRUCTED
TO DO SO.**

Question 1

- a) Using the premise of the Grossman Model for demand for health care and stating all relevant assumptions and intuitive reasoning highlight the effects of; ...
- i. Effects of age on the demand for human health capital. [3]
 - ii. The effects of wage on the demand for health capital [3]
 - iii. The effects of education on the demand for health capital [3]
- b) Using the premise of the Grossman model for demand for health care and stating all relevant assumptions and intuitive reasoning mathematically derive the following;
- i. Utility function [3]
 - ii. Health production function [3]
 - iii. The budget constraint [3]
 - iv. The time constraint [3]
- c) Assuming the static form of the model derive the equilibrium condition. Ensure to state all relevant assumptions. [4]

Question 2

- a) The demand of hospital care at Town A is $P = 15 - X$, where p is the price of a hospital service, and x is the quantity of services demanded by patients. Suppose there is only one hospital with the cost function $C = 20 + 5X$.
- i. Assuming that this hospital cares only the profit, compute the optimal price and quantity for hospital. [5]
- b) What is the HHI index based on output? [2]
- c) Suppose that this hospital is a non-profit hospital which has an incentive to provide as much health care as possible.
- i. Write down the zero-profit condition for this hospital. [3]
 - ii. Compute the price and quantity that this hospital would charge under zero-profit condition. [5]
 - iii. The method detailed above is known as break even analysis, define break even analysis and the break even point. [5]
 - iv. Which types of hospitals are likely to use this method in deciding how much of the health quantity to produce explain your answer. [5]

Question 3

Consider the following physician utility: $U = mx - 0.5i^2$ where m be the dollars per unit of service, x be the total unit of provided service, and i indicates the inducement that the physician takes to influence the patient's demand. It is believed that the relationship between x and i can be written as: $x = 6 - 0.2m + 0.2i$.

- Suppose the fee per unit of service is 10. Calculate the optimal inducement (i) and demanded service (x) for the physician. [5]
- Now the government announced a fee reduction from 10 to 5, how does the fee reduction affect the inducement? What is the optimal demanded service (x)? [5]
- According to (b), what portion of the change of x is due to the change of inducement? [5]
- According to (c), explain why it is empirically difficult to use the changes of demanded service after fee reduction as the evidence of PID. [5]
- Empirically testing the physician induced demand follows closely the model of McGuire and Pauly (1991), where they employ two markets (services) to identify PID. Can you explain the intuition why two markets (services) would help identifying PID? [5]

Question 4

A pharmaceutical Swazi - Medics considers in developing the new drug K. The annual demand of the new drug K is $x = 30 - 2p$, where p is the price of a prescription drug, and x is the quantity demanded by patients. For simplicity, assume that company B can produce the new drug an extra pill at a constant cost, and hence the marginal cost function is $MC = 4$.

- How much should Swazi - Medics charge for the price of Drug K? What is the annual profit? Please explain carefully [5]

Suppose the demand for Drug K comes from two towns: Lilongwe and Cairo, where $x_1 = 20 - p$ and $x_2 = 10 - p$ is the demand for each town separately

- Suppose that Swazi - Medics can charge different prices for each town. How much should Swazi - Medics charge for the new drug at Lilongwe and Cairo respectively? [5]
- Comparing (b) with (a), which one has a higher price at Lilongwe? Please use this result to explain why some branded name drugs charge an even higher price after the expiration of patent. [5]

The government grants the new drug's patent for three years. After three years, it is assumed that a generic drug would enter the market that could drive the market price near the marginal cost.

- d) Assume patients in Lilongwe have no interests in generic drug, and those in Cairo treat the new and the generic drug as indifferent (two drugs share the market equally). What is the annual profit of Swazi – Medics from Lilongwe and Cairo respectively after patent? [5]
- e) The CEO of Swazi - Medics has decided to develop Drug K if the company could recoup all the R& D cost (approximately SZL350) within five years. Based on these numbers, please help him decide whether he should invest the new drug (5% interest rate when calculating the present value). [5]

Question 5

John's demand for health care is given by the function $P = 200 - Q$. Suppose that the price is SZL80.

- a) How much insurance does he buy? [5]
- b) If he pays a copayment of SZL20 per unit of care, how much does he buy? [5]
- c) If he has a policy that covers 80% of expenditure, how much health does he buy if the price remains constant at SZL80? [5]
- d) Suppose that he is subject to a deductible of SZL12 000.00. If he satisfies the deductible, he pays a fixed copayment of SZL20 per unit of care. How much health care does he buy? [5]
- e) In each case (copayment, percentage of expenditure, deductible), calculate the deadweight loss to society at price SZL 80. [5]