

**Exam #1 - Fall 2006**

Read each question carefully. All answers must be clearly justified. Calculations must be detailed. Unjustified answers are worth zero points.

With a fair understanding of the material seen in class, it is possible to answer each question independently of the others using the information provided in the preceding questions.

You have 90 minutes to answer as many questions as possible. All questions carry equal weight: Do not waste all your time on answering one question.

Consider an economy in which the representative consumer has preferences over leisure ( $l$ ) and consumption ( $c$ ) described by the utility function  $U(c, l) = c^{0.5}l^{0.5}$ . This consumer has one unit of time. Hence, labour supply is  $N^s = 1 - l$ . The representative firm's production function is  $zN^d$  in which  $N^d$  is labour demand and  $z$  is a productivity index. The government buys one unit of the consumption good. Suppose that  $z = 2$ .

- 1) Explain what an indifference curve is. Does the consumer prefer the allocation  $c = 4$  and  $l = 0.25$  to the allocation  $c = 5$  and  $l = 0.2$ ? What about the allocation  $c = 4$  and  $l = 0.2$ ? **Explain.**
- 2) Explain what the production possibilities frontier is. Is the allocation  $c = 0.2$  and  $l = 0.5$  a possible equilibrium of this economy? **Explain.**
- 3) Give the four conditions that an allocation  $c^*$  and  $l^*$  must satisfy to be a competitive equilibrium.
- 4) Explain why it is possible to determine the competitive equilibrium of the present economy by obtaining the social planner's solution? What does this result mean for the design of government policy? **Explain.**
- 5) The conditions characterizing the social planner's solution is  $MRS_{lc} = MRT_{lc} = MP_N$  and  $C = zF(K, h - l) - G$ . Give an **intuitive** explanation of these conditions.
- 6) Show that the competitive equilibrium of this economy is  $c^* = 0.5$  and  $l^* = 0.25$ .
- 7) Find the consumer's real hourly wage rate, firm's profits, and the price of consumption goods which support this competitive equilibrium. **Justify** your answer.
- 8) Explain **intuitively** why the allocation  $c = 0.6$  and  $l = 0.2$  is not an equilibrium although this allocation is technically feasible.
- 9) Suppose that productivity goes from  $z = 2$  to  $z = 4$ . Illustrate with a graph the income effect and the substitution effect of this increase in productivity. Which effect dominates in the present case?
- 10) Suppose that you are the head of this economy's government. Would you increase or decrease government spending in this particular economy? **Explain.**