

考試科目	個體經濟學	所別	經濟所	考試時間	6月24日 上午第1節 星期二
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下列四題全部必答。

1. Describe the mechanism by which and the conditions under which an industry of a few large firms might reach the cartel optimum position without engaging in collusive behavior.

Compare the cartel result with the competitive result in terms of impacts on producers and consumers.

Discuss how and why break up of a cartel occurs.

For a domestic cartel, suggest government policies that might be used to correct inefficiencies in the market.

2. It is a well known neoclassical result that in the long run a constant returns to scale firm will earn zero profits but that the size of firm is indeterminate.

(a) Show how this result is arrived at.

(b) Provide arguments, logical, algebraical, graphical, as you deem appropriate, to show that when output price uncertainty exists in a risk averse firm with constant returns to scale (i) the size of firm is determinate and (ii) at this size the firm has positive expected profits.

3. A major use of natural gas is to dry corn after harvest. For several years a ceiling price for natural gas has been imposed by the federal government, but it is now proposed that the ceiling price be removed allowing the price of natural gas to increase. Trace the effects of an increase in the price of natural gas on firm output and industry supply and price of corn.

4. New York City licenses taxicabs in two classes: (1) for operation by companies with fleets, and (2) for operation by independent driver-owners having only one cab. It also fixes the rates that taxis charge. For many years now no new licenses have been issued in either class. There is an unofficial market in the "medallions" that signify the possession of a license. For example, a medallion for an independent cab in 1959 sold for about \$17,000 in this market.

(a) Discuss the factors determining the price of a medallion.

(b) What factors would determine whether a change in the fare fixed by the city would raise or lower the price of a medallion?

考試科目	總體經濟學	所別	經濟所	考試時間	6月24日(二)下午第2節
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以下問題全答，每題25分

1. 利用永久所得消費理論解釋為何薪資所得的邊際消費傾向大於資本利得所得的邊際消費傾向？
2. 根據資產組合平穩性 (portfolio balance) 模型，政府債券增加對利率有何影響？這個結果與李嘉圖對等性 (Ricardian equivalence) 假說的論述是否相同？
3. 導引預期擴大的菲力普曲線，並據以說明它的短期與長期形態。
4. 產出波動因循環成分或趨勢成分而起的性質有何不同？Lucas 如何以不對稱訊息解釋商業循環的發生呢？

考試科目	數理方法	所別	經濟所	考試時間	星期	月	日	上午第	下午第	節
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(35%) I. 已知 $s =$ 儲蓄率 $\delta =$ 折舊率 $n =$ 人口成長率
 $g =$ 勞動提升技術之增長率 $L =$ 有效勞動供給 $= e^{(g+n)t}$
 $Y =$ 產出 $K =$ 資本存量
 而內生變數為

$$k: \text{平均有效勞動之資本存量} = (K/L)$$

$$y: \text{平均有效勞動之產出} = (Y/L)$$

(5%) ① 若 g 之成長率為 g , 則 K 而 L 之成長率各為何?

(5%) ② 若總資源限制條件為

$$F(K, L) = c + b \cdot K + K$$

在 Cobb-Douglas 技術, 試導出

$$\dot{K} = s \cdot K^\alpha L^{1-\alpha} - \delta \cdot K \quad \text{動態條件}$$

(5%) ③ 試將總資源限制式以 k 表示之。

(5%) ④ 利用③之結果, 請找出 k 之 steady state.

(10%) ⑤ 如果動態條件以 k 表示成

$$\dot{k}(t) = s \cdot k(t)^\alpha - (\delta + n + g) \cdot k$$

則以上微分方程應如何解出?

(5%) ⑥ 若以上解答為 k^* , 則 $\lim_{t \rightarrow \infty} k^*(t) \rightarrow ?$

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(40%) II. 解釋名詞/並舉 - 應用於經濟學上之實例。(每題 10 分)

- ① Browning Motion
- ② Euler Equation
- ③ quasi-concavity
- ④ Kuhn-Tucker theorem

(25%) III. $\text{Max} \int_0^T u(x(t)) e^{-rt} dt$

$$\text{s.t. } \dot{y}(t) = f(y(t)) - \alpha \cdot y(t) - x(t)$$

$$y(0) = y_0 > 0 \quad y(T) = y_T > 0$$

$$y(t) \geq 0, \quad x(t) \geq 0$$

以上為經濟學中常用到之實際數理模型。
其中 $\alpha(t)$ 為控制變數。 $y(t)$ 為狀態 (state) 變數。

(15%) ① 通常我們會加上 $\begin{cases} \text{i) } u' > 0, u'' < 0, \forall x \geq 0 \\ \text{ii) } f(y) < \infty, f'(y) > 0, f''(y) < 0, \forall y < 0 \\ \text{iii) } f(0) = 0, f'(0) = \infty \text{ 及 } f'(\infty) = 0 \end{cases}$

等條件，請問其作用何在？試分別說明之。

(10%) ② 加上 ① 之條件後，解出以上問題。