國立中山大學九十二學年度碩士班招生考試試題

科目：總體經濟學（經濟所）

一、底下係一 IS-LM 模型：

$$Y = C(Y-T) + I(R) + G,\ 0 < C' \equiv \frac{dC}{d(Y-T)} < 1,\ I' \equiv \frac{dI}{dR} < 0$$

$$L(Y,R) = \frac{M}{P},\ L_Y \equiv \frac{\partial L}{\partial Y} > 0,\ L_R \equiv \frac{\partial L}{\partial R} < 0$$

式中 Y = 產出，C = 消費支出，T = 定額稅賦，I = 投資支出，R = 利率，G = 政府支出，L = 實質貨幣需求，M = 貨幣供給，P = 固定的物價水準。

有些經濟學者主張上述模型具模型設定的不一致性，因為政府支出政策並沒有考慮任何的融通問題，貨幣政策則不知透過何種機制來施行。如果你是一位經濟學者，則你會以何種的經濟邏輯贊同上述的評論或維護 IS-LM 模型係設定上一致性？

二、底下係一 Mundell（1963）模型：

$$Y = C(Y) + I(R) + G + B(E, Y, Y^*) + \varepsilon$$

$$L(Y,R) + v = D + FR$$

$$R = R^*$$

式中 Y = 本國產出，C = 消費支出（$0 < C' < 1$），R = 本國利率，I = 投資支出（$I' < 0$），G = 政府支出，E = 匯率（以本國貨幣表示之外幣價格），Y^* = 外國產出，B = 貿易收支（$B_E > 0$，$B_Y < 0$，$B_{Y^*} > 0$），ε = 商品市場的隨機變數（平均數為 0，變異數為 σ_ε^2），L = 實質貨幣需求（$L_Y > 0$，$L_R < 0$），v = 貨幣市場的隨機變數（平均數為 0，變異數為 σ_v^2），D = 國內信用，FR = 外匯存底（以本國貨幣表示），R^* = 外國利率。

如果貨幣當局的目標係追求所得水準的穩定，則於經濟體系同時面臨商品市場及貨幣市場的隨機干擾時，貨幣當局應該採行固定匯率制度抑或浮動匯率制度？

三、底下係一涵蓋民眾預期形成的總體模型：

總合需求函數 $P_t = -\alpha(Y_t - Y_{t-1}) + M_t + u_t;\ \alpha > 0,\ u_t \sim N(0, \sigma_u^2)$

總合供給函數 $Y_t = Y_{t-1} + \beta(P_t - {}_{t-1}P_t^e) + \varepsilon_t;\ \beta > 0,\ \varepsilon_t \sim N(0, \sigma_\varepsilon^2)$

式中 P_t 代表 t 時的物價水準，Y_t 代表 t 時的產出，Y_{t-1} 代表 $t-1$ 時的產出，M_t 代表 t 時的貨幣供給，u_t 代表 t 時的需求面隨機干擾（平均數為 0，變異數為 σ_u^2），${}_{t-1}P_t^e$ 代表民眾於 $t-1$ 時對 t 時物價水準的主觀猜測值，ε_t 代表 t 時的供給面隨機干擾項（平均數為 0，變異數為 σ_ε^2）。

試根據以上模型（1）釐清適應性預期（adaptive expectations）及理性預期（rational expectations）係分別屬於外生性預期抑或內生性預期？（2）推導並繪圖說明理性預期形成的「政策無效命題」及「出乎意料之外的政策有效」。

四、於實質景氣循環模型，若勞動供給者有貨幣幻覺存在，則實質景氣循環模型的主張"實質面的干擾是景氣波動的根源，貨幣面的干擾無法主導景氣的波動"是否依然有效？

五、試說明經濟成長的「絕對收斂假說」與「相對收斂假說」。

每題配分 20分，共 100分。

國立中山大學九十二學年度碩士班招生考試試題

科目：個體經濟學（經濟所）

I. 選擇題，並簡述其經濟理論意涵 (15%)

1. If a tax is imposed on a market with elastic demand and inelastic supply,
   a. buyers will bear most of the burden of the tax.
   b. sellers will bear most of the burden of the tax.
   c. the burden of the tax will be shared equally between buyers and sellers.
   d. it is impossible to determine how the burden of the tax will be shared.

2. When workers are in an industry that is experiencing rapid improvements in technology, they can expect to

   a. have wages decline.
   b. experience wage increases, as their productivity is enhanced.
   c. see a reduction in the need for physical capital.
   d. see a reduction in demand for final products.

3. In the market for hotel rooms in large metropolitan markets, the cost of a single night stay can be several times higher than a similar room in a small urban market. If the market for hotel rooms is characterized by monopolistic competition, this difference in price can be partially explained by

   a. a higher cost for accommodations to compensate for the lower cost of airfare into metropolitan markets.
   b. the markup of price over a higher marginal cost in large metropolitan markets.
   c. the cost of living in a large city.
   d. transportation access.
   e. the third degree price discrimination

II. 簡答題： (20%)

1. A risk-averse individual is offered a choice between a gamble that pays a $1000 with a probability of 25% and $100 with a probability of 75%, or a payment of $325. What will he choose?

2. What is the dominant Nash equilibrium strategy for the repeated prisoner's dilemma game when both players know that the game will end after one million repetitions? If you were going to run an experiment with human players for such a scenario, would you predict that players would use this strategy?

III. 問答題

1. Consider the production function $y = x_1^{\alpha} x_2^{\beta}$. Show the constant-output factor demand functions. Show the associated cost function. (15%)

2. Let G_i be the contribution to the public good of individual i, the total quantity of public good supplied is $G = \sum_{i=1}^{n} G_i$. Each individual's utility function is given as: $U_i = X_i^{\alpha} G^{\beta}$, $\forall i = 1,...,n$, where $0 < \alpha, \beta < 1$.

Her objective function is thus:

$$O_i = X_i^{\alpha} G^{\beta} + \lambda_i (Y_i - P_x X_i - P_G G_i), \quad \forall i = 1,...,n$$

where P_x is the price of the private good X, P_G is the price of G, and Y_i is income.

Suppose the welfare function of the community with these n persons is:

$$W = \sum_{i=1}^{n} U_i$$

a) How many public good will be provided in equilibrium if G is voluntarily contributed by each individual?(10%)

b) How many public good is required for Pareto optimality?(10%)

c) Show that the relative gap between the two quantities declines as community size increases.(5%)

3. There are three players, A. B, and C, and three alternatives, X, Y, and Z. Players vote simultaneously for an alternative; vote-buying, vote-exchange, and abstaining are not allowed. The alternative with the most votes wins; if no alternative receives a majority, the alternative X is selected. The payoff functions are:

$$U_A(X) = U_B(Y) = U_C(Z) = 2$$
$$U_A(Y) = U_B(Z) = U_C(X) = 1$$
$$U_A(Z) = U_B(X) = U_C(Y) = 0$$

a) What are the Nash equilibria? (20%)

b) How many pure-strategy equilibrium outcomes does this game have? And what are these outcomes? (5%)

Answer the following five questions, equally weighted

1. Suppose that X has a exponential pdf, $f_X(x) = (1/\lambda)e^{-x/\lambda}, x > 0$. Find the moment-generating function for X. (20%)

2. Let $Y_1, Y_2, ..., Y_n$ be a random sample from the Poisson pdf $f_Y(y;\theta) = e^{-\theta}\theta^y/y!, y = 0, 1, 2, ...$ Find the Maximum likelihood estimator for θ and the Cramer-Rao lower bound. (20%)

3. Let Y be uniformly distributed on the interval (0,1). Conditionally on $Y = y$, let X be uniformally distributed on the interval $(0, y)$. Find

$$E(X|Y),\ EX,\ E(X^2|Y),\ var(X).$$

(20%)

4. Let X_1, X_2, and X_3 be independent, with $X_1 \sim N(1, \sigma^2), X_2 \sim N(-1, \sigma^2)$ and $X_3 \sim N(0, \sigma^2)$. Let

$$q(\mathbf{X}) = \frac{\mathbf{X_1^2} + \mathbf{X_2^2} + \mathbf{2X_3^2} + \mathbf{2X_1X_2}}{\mathbf{2}}.$$

Find the distribution of $q(\mathbf{X})$. (20%)

5. Let $Y_1, Y_2, ..., Y_n \sim N(\mu, \sigma^2)$. To test $H_0 : \sigma^2 = \sigma_0^2$ versus $H_1 : \sigma^2 \neq \sigma_0^2$ at the α level of significance, find the rejection region. Why? (20%)