

- 1.(25%)某廠商的生產函數為 $Q=AL^{1/2}K^{1/2}$ ，其中 $A>0$ ， Q 代表產量， L 與 K 分別代表勞動量與資本量。假設短期資本量為 100，勞動及資本的價格分別為 r 與 w ，且兩者價格相等，請回答以下問題：
- (1)廠商的短期平均成本與邊際成本？(5%)
 - (2)若市場為完全競爭，求廠商的短期供給函數？(5%)
 - (3)短期市場價格低於何種水準，廠商會退出市場？(3%)
 - (4)假設廠商追求成本極小化下，請問長期成本函數為何？生產函數之規模報酬為遞增、遞減或固定？請說明。(12%)

- 2.(25%)某一商品在 A 國由一廠商供應，此廠商總成本曲線為 $TC=50+10Q+0.5Q^2$ ，而市場需求曲線為 $Q=50-0.5P$ ，請回答以下問題：
- (1)利潤極大下，廠商訂價為多少？生產多少？可獲得多少利潤？(8%)
 - (2)相較於完全競爭市場，A 國市場的社會福利損失為何？請以圖形加以說明。(8%)
 - (3)假設此廠商成功開拓 B 國市場且獨家供應相同產品，該產品在兩個市場可以完全區隔銷售，而 B 國市場的需求函數為 $Q_B=100-P_B$ ，請問此獨占廠商在 A 國與 B 國等兩國市場訂價各為多少？各銷售多少數量？廠商的生產量？(9%)

3.(35%)Use the following set-up for the subsequent analysis:

$$\begin{aligned}C &= \alpha_0 + \alpha_1 Y \\ I &= \gamma_0 + \gamma_1 Y - \gamma_2 r \\ M/P &= \psi_0 + \psi_1 Y - \psi_2 r \\ NX &= \eta_0 - \eta_1 Y - \eta_2 e\end{aligned}$$

Where C is consumption in real terms, Y is real GNP, I is the investment in real terms, r is the interest rate, M is nominal money supply, P is the price level, NX is the net export, e is the exchange rate; $\alpha_i, \gamma_i, \psi_i, \eta_i, i \in \{0,1,2\}$ are all positive.

- (1) Please discuss all the scenarios concerning the role of slope of IS, LM, and Net-export curve in determining the effect of government expenditure, real money supply, and trade balance on national output level. Incorporate the idea of Keynesian multiplier, interest-rate effect, and quantity theory of money in your analysis. (12%)
 - (2) How would the relationship between net export and output assumed here change the effect of fiscal contraction and monetary expansion, respectively, on output level, exchange rate, trade balance, and net capital outflow under two exchange rate regimes, fixed and floating, for a small open economy? Compare this set of result with the scenario when net export is assumed to only depend on exchange rate and with the case of large open economy. Concisely discuss all the possible cases with the diagrams/figures. (18%)
 - (3) What's the missing piece in this construct? How would accounting for the missing puzzle tells us more about the effect of such piece associated with a risk premium on interest rate in small open economy? Please concisely discuss all the likely cases. (5%)
- 4.(15%) Assume the economy is comprised of three sectors, manufacturing firms, research institution (include university), and service sector. Manufacturing and service sector are those who need to acquire knowledge, and university/research institutions are those who produce knowledge. Here we also assume that the service sector itself also has reciprocal effect on knowledge production and diffusion. The growth of national population however remains stagnant.

$$\begin{aligned}Y_M &= F[K_M, (1 - u_R - u_S)LE_M] \\ Y_S &= F[K_S, (u_S)LE_S] \\ \frac{\Delta E}{E} &= g(u_S, u_R)\end{aligned}$$

u_R is the fraction of labor force in research institutions, u_S is the fraction of labor force in service sector, E is the stock of knowledge (in turn determining the efficiency of labor), LE measures the effective number of workers, g is a function that shows how the growth in knowledge depends on the fraction of labor force in both research units and service sector. Derive the

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國立臺灣大學 112 學年度碩士班招生考試試題

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steady-state condition and maximized consumption rule. Use the diagram to discuss the effect on steady-state capital per effective worker and investment under the following scenarios. In the end, order the level of steady-state capital per effective worker, steady-state output level, and consumption level at golden rule steady state among the three scenarios. Remember to provide rationale for your answers.

- (1) The government increases the funding for research in humanities, social science, and natural sciences, including expanding fellowship opportunities for graduate studies.
- (2) The government shifts the education policy priority toward the vocational education and training.
- (3) The service and high-tech sector get more aggressively in providing internship opportunities to students and more actively recruit fresh graduates from colleges.

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