

# 國立中興大學99學年度碩士班招生考試試題

科目：經濟學

系所：財務金融學系

本科目試題共4頁

答案本上已註明題號，請將各題答案填入正確位置。每題四分，滿分一百分。

答案若寫在未註明題號之空白頁，視同未作答。

未註明題號之空白頁可供計算用。

你可以中文或英文作答，也可使用非記憶式計算機(限用 $+$ 、 $-$ 、 $\times$ 、 $\div$ 、 $\sqrt{\quad}$ 、指數、對數、冪數及三角函數等功能)。

Questions 1-3. A person has income  $w$ , and spends his income on consuming goods 1 and 2. The amounts of goods consumed are  $x_1$  and  $x_2$ . The prices of the two goods are  $p_1$  and  $p_2$ . The person gets utility from the consumption of the two goods, and from the money he has in the bank,  $m = w - p_1x_1 - p_2x_2$ . The person's utility function is  $u(x_1, x_2, m) = 10 \ln x_1 + \ln x_2 + m$ . The person always maximizes his utility.

1. Suppose that  $w = 10$ . What is the person's demand function for  $x_1$ ?
2. Suppose that  $w = 20$ , how much money will the person put in the bank?
3. Suppose that  $w = 30$ . What is the person's price elasticity of his demand for  $x_1$ ? [Take the absolute value of the elasticity.]

Questions 4-6. A farmer grows rice. If there is enough rain (case A) in the next three months, he will make a profit of \$30,000. If it does not rain much (case B), his profit will be only \$10,000. From his experience, he believes the probability of case A is  $1/2$ . His current wealth is \$10,000, so his final wealth will be either \$40,000 or \$20,000. Let  $W$  be his final wealth. His (Bernoulli) utility function of  $W$  is  $U(W) = \sqrt{W}$ .

4. Suppose the government provides an insurance plan for the farmer. If he pays  $\$0.5X$  to the government now, he will get  $\$X$  from the government when case B occurs, but will get nothing when case A occurs. What is the optimal  $X$  for him?
5. Suppose there is no insurance plan. The farmer can drill a well to prepare for the rain shortage. It costs  $C$  dollars to drill a well. When case A occurs, the well is useless. When case B occurs, the farmer can still have enough water, and get \$30,000 from selling rice. So his final wealth will be  $\$40,000 - C$  in both case A and case B. What is the amount of  $C$  for him to be indifferent between drilling and not drilling?
6. Suppose  $C = 12,000$ . Now there is a weather expert who can predict perfectly the amount of rainfalls. If the expert predicts that there will be enough rain, the farmer does not need

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to invest on the well. If he predicts that the rain will not be enough, then the farmer knows he should invest. However, it costs  $I$  dollars to buy the information. Write down the equation that determines the maximal amount of  $I$  that the farmer is willing to pay for the information.

**Questions 7-8.** Suppose the car market is monopoly. The cost function of cars is  $c(x) = 11x$ , where  $x$  is the quantity of cars. The demand function for cars is  $x = 13100 - 100p$ , where  $p$  is the price. The manufacturer, company M, does not sell directly to consumers. Instead, it sells the cars to the retailer, company R, and then R sells the cars to consumers. To sell a car, R needs to buy a car from M at price  $w$  (the wholesale price) but there is no other cost for selling cars. If R charges the price of car as  $p$ , then R's profit is  $\Pi_R = (p - w)x$ . R acts as a monopolist in the retail market. R will order from M the exact amount of cars it will sell, and so if R sells  $x$  cars, company M will have a profit  $\Pi_M = (w - 11)x$ .

7. What is the price that maximizes R's profit? Write it as a function of  $w$ .

8. What is the wholesale price  $w$  that maximizes M's profit?

**Questions 9-10.** Continue from the last two questions. Suppose company M is considering whether to sell to consumers directly. The cost for M to sell 1 car to a consumer is  $k$ . So M's profit will be  $\Pi_M = (p - 11 - k)x$ , if M sets the price of car as  $p$ .

9. What is M's maximal profit from selling directly to consumers? Write this profit as a function of  $k$ .

10. Consumers will prefer buying directly from M if  $k < \hat{k}$ , and prefer buying from R if  $k > \hat{k}$ . What is the value of  $\hat{k}$ ?

**Questions 11-13.** In a perfect competition industry, The demand function is  $x = 10000 - 500p$ . The total cost function of a firm is  $c(x) = 2x + 0.01x^2 + F$ , where  $x$  is the amount of output and  $F$  is the fixed cost. Firms might have different values of  $F$ . The following questions are independent.

11. In the short run, suppose there are 50 firms whose fixed costs are all  $F = 100$ . What is the equilibrium price?

12. In the short run, suppose there are 10 firms whose  $F$  is 50, and 10 firms whose  $F$  is 100. What is the equilibrium price?

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13. In the long run, firms can exit or enter the industry freely. A firm exiting the industry will have 0 cost. A firm stays in or enters the industry will have a total cost function  $c(x) = 2x + 0.01x^2 + 100$ . How many firms will be in the industry?

Questions 14-16. An economy has the production function  $Y_t = AN_t^{0.5}K_t^{0.5}$  in period  $t$ , where  $Y_t$  is the output,  $N_t$  is the population, and  $K_t$  is the capital stock in period  $t$ . The depreciation rate is  $d = 0.1$ , and the population growth rate is  $n = 0.05$ . Saving is  $S_t = 0.3Y_t$ . Let  $C_t$  be the consumption in period  $t$ . The per-person output, per-person capital stock, and per-person consumption are  $y_t = Y_t/N_t$ ,  $k_t = K_t/N_t$ , and  $c_t = C_t/N_t$ . The steady state value of  $c_t$  is  $c^*$ .

14. Write  $c^*$  as a function of  $A$ .
15. How would  $c^*$  change when the economy accepts more immigrants?
16. How would  $c^*$  change when the economy cuts its interest rate?

Questions 17-19. An economy has the  $IS$  curve:

$$r = (20500 - 8Y)/10000,$$

where  $r$  is the real interest rate, and  $Y$  the real GDP. The  $LM$  curve is

$$r = (-50 + Y)/1000 - 2664/(10P),$$

where  $M$  is the nominal money supply, and  $P$  is the price level. The full-employment output is  $\bar{Y} = 2500$ .

17. Derive the equation of the aggregate demand curve.
18. The short-run aggregate supply curve is

$$Y = \bar{Y} + 10(P - P^e),$$

where  $P^e$  is the expected price level. If  $P^e = 130$ , what is the price level in the short-run equilibrium?

19. What is the price level in the long-run equilibrium?

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**Questions 20-21.** Assume there are two countries: Home and Foreign. The following events are independent from each other. Assume other things remaining the same in each question.

20. The Home country's output increases. Will the Home country's currency appreciate or depreciate?
21. The Foreign country's output increases. Will the Home country's currency appreciate or depreciate?

**Questions 22-25.** Assume there are only two countries in the world: Home and Foreign. They are both in the world that classical macroeconomics is correct. Home country uses the currency  $h$ , and Foreign country uses the currency  $f$ . The aggregate demand of Home country is

$$Y = 400 + 50M/P,$$

and the aggregate supply is

$$Y = \bar{Y} = 1000$$

The money supply in Home is 48  $h$ . The price level in Foreign country is 20. The real exchange rate between the two currencies is 1  $h$  equal 5  $f$ .

22. What is the price level in Home?
23. In the foreign exchange market equilibrium, 1  $h$  is worth  $x$  amount of  $f$ . What is the value of  $x$ ? [This is the nominal exchange rate.]
24. Suppose the central bank of Home sets the nominal exchange rate as 1  $h$  equal 50  $f$  and keeps the rate fixed. What will happen to this central bank's stock of official reserve asset?
25. Suppose the central bank of Home sets 1  $h$  equals 50  $f$  and keeps the rate fixed. The central bank also changes its money supply to  $y$ . How much should  $y$  be for the rate that 1  $h$  equal 50  $f$  to be the equilibrium?