

國立高雄大學九十七學年度研究所碩士班招生考試試題

科目：財務管理
考試時間：100 分鐘

系所：
金融管理學系碩士班
本科原始成績：100 分

是否使用計算機：是

I. Multiple Choice Questions (2 points each, total 60 points)

Note: Use the following format to write your answers of this section in your answer sheet. No points will earn without the following format in this section.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
16	17	18	19	20	21	22	23	24	25	26	27	28	29	30

1. A T-bill pays 5 percent rate of return. Would risk-averse investors invest in a risky portfolio that pays 8 percent with a probability of 40 percent or 3 percent with a probability of 60 percent?
 - a. Yes, because they are rewarded with a risk premium.
 - b. No, because they are not rewarded with a risk premium.
 - c. No, because the risk premium is small.
 - d. Cannot be determined.
 - e. None of the above.
2. Two bonds are selling at par value and each has 17 years to maturity. The first bond has a coupon rate of 8% and the second bond has a coupon rate of 12%. Which of the following is true about the durations of these bonds?
 - a. The duration of the higher-coupon bond will be higher.
 - b. The duration of the lower-coupon bond will be higher.
 - c. The duration of the higher-coupon bond will equal the duration of the lower-coupon bond.
 - d. There is no consistent statement that can be made about the durations of the bonds.
 - e. The bond's durations cannot be determined without knowing the prices of the bonds.
3. If the interest rate on debt is lower than ROA, then a firm will _____ by increasing the use of debt in the capital structure.
 - a. increase the ROE
 - b. not change the ROE
 - c. decrease the ROE
 - d. change the ROE in an indeterminable manner
 - e. none of the above
4. A firm has a P/E ratio of 18 and a ROE of 13% and a market to book value of _____.
 - a. 0.64
 - b. 0.92
 - c. 2.34
 - d. 1.56
 - e. none of the above

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5. In a well diversified portfolio
- market risk is negligible.
 - systematic risk is negligible.
 - unsystematic risk is negligible.
 - nondiversifiable risk is negligible.
 - none of the above.
6. Your opinion is that security A has an expected rate of return of 0.125. It has a beta of 1.5. The risk-free rate is 0.04 and the market expected rate of return is 0.11. According to the Capital Asset Pricing Model, this security is
- underpriced.
 - overpriced.
 - fairly priced.
 - cannot be determined from data provided.
 - none of the above.
7. Bach Airline is expected to pay a dividend of \$8 in the coming year. Dividends are expected to grow at the rate of 15% per year. The risk-free rate of return is 6% and the expected return on the market portfolio is 14%. The stock of Bach Airline has a beta of 3.00. The intrinsic value of the stock is _____.
- \$53.33
 - \$50.00
 - \$56.00
 - \$62.50
 - none of the above
8. The optimal capital structure has been achieved when the:
- debt-equity ratio is equal to 1.
 - debt-equity ratio is equal to 2.
 - cost of equity is minimized given a pre-tax cost of debt.
 - debt-equity ratio is such that the cost of debt is equal to the cost of equity.
 - debt-equity ratio selected results in the lowest possible weighed average cost of capital.
9. The optimal capital structure will tend to include more debt for firms with:
- the highest depreciation deductions.
 - the lowest marginal tax rate.
 - substantial tax shields from other sources.
 - less taxable income
 - none of the above
10. All else equal, the payback period for a project will decrease whenever the:
- initial cost increases.
 - required return for a project increases.
 - assigned discount rate decreases.
 - duration of a project is lengthened.
 - none of the above

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11. The internal rate of return (IRR):
- rule states that a typical investment project with an IRR that is larger than the required rate should be accepted.
 - is the rate generated solely by the cash flows of an investment.
 - is the rate that causes the net present value of a project to exactly equal zero.
 - can effectively be used to analyze all investment scenarios.
 - I and IV only
 - II and III only
 - I, II, and III only
 - II, III, and IV only
 - none of the above
12. NUK Company is a relatively new firm that is still in a period of rapid development. The company plans on retaining all of its earnings for the next five years. Six years from now, the company projects paying an annual dividend of \$2.5 a share and then increasing that amount by 5% annually thereafter. To value this stock as of today, you would most likely determine the value of the stock _____ years from today before determining today value.
- 4
 - 5
 - 6
 - 7
 - 8
13. NUK Company has paid annual dividends of \$1.40, \$1.75, and \$2.00 a share over the past three years, respectively. The company now predicts that it will maintain a constant dividend since its business has leveled off and sales are expected to remain relatively constant. Given the lack of future growth, you will only buy this stock if you can earn at least a 12% rate of return. What is the maximum amount you are willing to pay to buy one share today?
- \$10.00
 - \$13.33
 - \$16.67
 - \$18.88
 - \$20.00
14. According to the efficient market hypothesis, financial markets fluctuate daily because they:
- are inefficient.
 - slowly react to new information.
 - are continually reacting to new information.
 - offer tremendous arbitrage opportunities.
 - none of the above
15. Which of the following statements is true?
- In efficient markets, a stock's price should change with the arrival of new information.
 - Strong form market efficiency is not supported by the empirical evidence.
 - Studies by Fama and French and others find returns of high book to market stocks are higher than low book to market value stocks.
 - All of the above.
 - None of the above.

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16. An IPO of a firm formerly financed by venture capital is carried out for what primary purposes:
 - A) Generate cash to pay down bank indebtedness.
 - B) To establish a market value for the equity and provide funds for operations.
 - C) Insiders can sell their shares or cash out.
 - D) A and C.
 - E) all of the above.

17. The Taiwan Oil Company (TOC) is considering a project that will cost \$50 million and have a year-end after-tax cost savings of \$7 million in perpetuity. TOC's before tax cost of debt is 10% and its cost of equity is 16%. The project has risk similar to that of the operation of the firm, and the target debt-equity ratio is 1.5. What is the NPV for the project if the tax rate is 34%?
 - A) \$17.568 Million.
 - B) \$ 6.452 Million.
 - C) \$11.947 Million.
 - D) \$ 7.189 Million.
 - E) none of the above.

18. If the WACC is used in valuing a LBO:
 - A) the flotation costs must be added to the total UCF.
 - B) the WACC must be recalculated as the debt is repaid and the cost of capital increases.
 - C) the tax shields of debt are not available because the corporation is no longer publicly traded.
 - D) the WACC remains constant because of the final target debt ratio desired.
 - E) all of the above.

19. A financial lease is likely to be most beneficial to both parties when:
 - A) the lessor's tax rate is lower than the lessee's.
 - B) a financial lease cannot be beneficial to both parties.
 - C) the lessor's tax rate is higher than the lessee's.
 - D) a financial lease always has zero NPV, so both parties always break even.
 - E) the lessor's tax rate is equal to the lessee's.

20. A stock dividend and a stock split are similar in that
 - A) cash is paid out and the only other effect is on the retained earnings account.
 - B) they are totally dissimilar.
 - C) cash is paid out and the number of shares outstanding increases.
 - D) no cash is paid out and the number of shares outstanding increase.
 - E) both changes affect only the common stock account.

21. The payoff diagram for a put with the same exercise price and premium as the call on the same underlying asset with the same maturity is:
 - A) exactly the same as the call diagram for the given exercise price.
 - B) unrelated to the call diagram no matter what the exercise price.
 - C) the inverse of the call diagram along the put price.
 - D) the mirror image of the call diagram around the exercise price.
 - E) None of the above.

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22. Venture capitalists provide financing for new firms from the seed and start-up stage all the way to mezzanine and bridge financing. In exchange for financing, entrepreneurs give:
- A) control to a court appointed trustee.
 - B) a high interest rate debt instrument and control.
 - C) an equity position and usually board of director positions.
 - D) high salaries to venture capitalists as CEOs and CFOs.
 - E) up the right to have an initial public offering.
23. Collegiate Tuxedo rents apparel throughout the year. They have experienced non-payment by about 15% of their customers with an average loss of \$200. Collegiate wants to stem their losses by using an instant electronic credit check on the customer. These checks will cost them \$7 on each of the 1000 customers. The opportunity cost is 1.5% for the credit period. Should they pursue the credit check?
- A) Yes, because the net gain is \$193,000.
 - B) No, because the \$7000 cost is too high.
 - C) Yes, because the net gain is \$23,000.
 - D) No, because a \$200 loss is minor.
 - E) Yes, because the net gain is \$30,000.
24. To determine the value of a rights, the stockholder needs to know what two pieces of information in addition to the current stock price:
- A) the detachment date and the subscription price.
 - B) the amount of new equity to be raised and standby fee.
 - C) the subscription price and the number of rights needed to acquire a new share.
 - D) the amount of new equity to be raised and the number of rights needed to acquire a new share.
 - E) none of the above.
25. Firm ABC is paying \$750,000 in interest payments a year while Firm XYZ is paying LIBOR plus 75 basis points on \$10,000,000 loans. The current LIBOR rate is 6.5%. Firm ABC and XYZ have agreed to swap interest payments, how much will be paid to which Firm this year?
- A) \$25,000 to Firm XYZ.
 - B) \$750,000 to Firm XYZ.
 - C) \$725,000 to Firm ABC.
 - D) \$25,000 to Firm ABC.
 - E) none of the above.
26. Concerning convertible bonds, which of the following statements is not correct?
- A) The value of a convertible bond will generally be greater than its conversion value.
 - B) The difference between the conversion value and the straight bond value is the conversion or option premium.
 - C) The coupon rate on a nonconvertible bond will generally exceed the coupon rate on an otherwise identical convertible bond.
 - D) The value of a convertible bond will generally be greater than its straight bond value.
 - E) All of the above are correct.
27. The risk-neutral probabilities for an asset, with a current value equal to the present value of future payoffs are:
- A) given by the value of the underlying asset under good news and bad news.
 - B) given by the probability of each state occurring.
 - C) given by the value of the underlying asset under good news, bad news, and the risk free rate.
 - D) given by the value of the underlying asset under good news and the risk free rate.
 - E) none of the above.

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28. Suppose a stock can be purchased for \$8, a put option on the stock can be purchased for \$1.50, and a call option on the stock can be written (i.e., sold) for \$1.00. If holding these positions in combination can guarantee a payoff of \$10 at the end of the year, then what must be the risk-free rate if no arbitrage opportunities exist?
A) 12.50%. B) 18.75%. C) 33.33%. D) 5.50%. E) 17.65%.
29. The DAB Corporation with a book value of \$20 million and a market value of \$30 million has merged with the CLC Corporation with a book value of \$6 million and a market value of \$8 million at a price of \$9 million. If the transaction is a purchase will there be any goodwill and if so what is the amount of goodwill?
A) Yes goodwill; 1.
B) No goodwill; 0.
C) Can not be calculated with the information given.
D) Yes goodwill; 3.
E) None of the above.
30. Credit scoring models are used by lenders to:
A) assess the maximum growth rate for the firm.
B) determine the borrowers capacity to pay.
C) aid in the prediction of default or bankruptcy.
D) determine the optimal debt equity ratio.
E) none of the above.

II. Problem Solving and Essay Questions (total 40 points)

1. A project is expected to create operating cash flows of \$30,000 a year for three years. The initial cost of the fixed assets is \$60,000. These assets will be worthless at the end of the project. An additional \$10,000 of net working capital will be required throughout the life of the project. What is the project net present value if the required rate of return is 10%? (7 points)
2. NUK company will pay an annual dividend of \$2.06 a share on its common stock next year. Last week, the company paid a dividend of \$2.00 a share. The company adheres to a constant rate of growth dividend policy. What will one share of NUK company common stock be worth eight years from now if the applicable discount rate is 10%? (7 points)
3. What is agency problem of equity? How can Shareholders attempt to ease this problem? (6 points)
4. The exchange rate market is very volatile recently. Since Taiwan is a country heavily relying on international trading, hedging exchange rate risk is an important issue. If you were an exporter in Taiwan, you decide to hedge the exchange rate risk by either money market hedge or forward hedge. Assume that the interest rate parity holds. What are the outcomes of these two approaches of hedging? Why? (10 points)
5. Duration hedging is one of the hedging approaches used by a corporation.
a. What is duration hedging? Define it. (5 points)
b. What kind of the risk is hedged by using the duration measurement? Explain it. (5 points)

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I. Multiple Choice (Choose one answer for the multiple choice, 50%)

1. Men arrive at a service centre according to a Poisson at an average of 6 per hour, women arrive at a service centre according to a Poisson at an average of 12 per hour, and children arrive at a service centre according to a Poisson at an average of 12 per hour. If the centre opens at 9.00 a.m., determine the probability that Andy is the first customer arriving at the centre after 9.10 a.m. (5%)

(A) 0.0067 (B) 0.0025 (C) 0.3979 (D) 0.0076

$$e^{-1}=0.3979, \quad e^{-2}=0.1353, \quad e^{-3}=0.0498, \quad e^{-4}=0.0183, \quad e^{-5}=0.0067$$
$$e^{-6}=0.0025, \quad e^{-7}=0.0009, \quad e^{-8}=0.0003$$

2. A municipal bond service has three rating categories (A, B, and C). Suppose that in the past year, of the municipal bonds issued throughout the US, 70% were rated A, 20% were rated B, and 10% were rated C. Of the municipal bonds rated A, 50% were issued by cities, 40% were issued by suburbs, and 10% by rural areas. Of the municipal bonds rated B, 60% were issued by cities, 20% were issued by suburbs, and 20% by rural areas. Of the municipal bonds rated C, 90% were issued by cities, 5% were issued by suburbs, and 5% by rural areas. If a new municipal bond is to be issued by a city, what is the probability that it will receive an A rating? (5%)

(A) 0.525 (B) 0.475 (C) 0.625 (D) 0.375

3. If $n=100$, $\bar{X}=80$, $\hat{S}^2=16$, \hat{S}^2 is used to be the estimator of σ^2 . If $P(|\frac{\hat{S}^2}{\sigma^2}-1|\leq a) = 0.95$, please calculate the value of a . (5%)

(A) 0.2059 (B) 0.2786 (C) 0.2184 (D) 0.1953

4. According to the question above, how many extra observations we should select if we require the value of a to be 0.21? (5%)

(A) 72 (B) 73 (C) 74 (D) 76

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Assume that $X_i \sim N(\mu, \sigma^2)$, $i = 1, \dots, n$ and $Z_i \sim N(0, 1)$, $i = 1, \dots, k$, if all variables are independent, please indicate what the distributions are in the following. If its distribution is uncertain, please choose unknown.

5. $Z_1^2 - Z_2^2$ (5%)
 (A) $t_{(1)}$ (B) $N(0, 1)$ (C) unknown (D) $\chi^2_{(2)}$

6. $\frac{\sqrt{nk}(\bar{x} - \mu)}{\sigma \sqrt{\sum_{i=1}^k z_i^2}}$ (5%)
 (A) $t_{(1)}$ (B) $N(0, 1)$ (C) unknown (D) $F_{(v_1=n, v_2=k)}$

7. $\frac{\sum_{i=1}^n \left(\frac{X_i - \mu}{\sigma}\right)^2}{\sum_{i=1}^k Z_i^2}$ (5%)
 (A) $F_{(v_1=k, v_2=n)}$ (B) $F_{(v_1=n, v_2=k)}$ (C) $F_{(v_1=k-1, v_2=n-1)}$ (D) $F_{(v_1=n-1, v_2=k-1)}$

Testing

A hardware manufacturer produce bolts of 10 mm diameter in factory A. Suppose that an acceptable standard deviation for the bolt diameters is less than 0.09 mm. The manufacturer wants to decide whether the diameters of the bolts produced in factory A vary too much by performing a hypothesis test. The manufacturer takes a random sample of 12 bolts and derived a sample standard deviation of 0.047mm. Answer question 8 to question 10.

8. The null and alternative hypothesis for the intended test will be: (5%)
 (A) $H_0: \sigma=0.09; H_1: \sigma \neq 0.09$ (B) $H_0: \sigma \geq 0.09; H_1: \sigma < 0.09$
 (C) $H_0: \sigma \leq 0.09; H_1: \sigma > 0.09$ (D) $H_0: \sigma \leq 0.047; H_1: \sigma > 0.047$
9. The value for the testing statistics is around: (5%)
 (A) 1 (B) 2 (C) 3 (D) 4

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10. The manufacturer draws another random independent sample of size 10 from factory B and finds the standard deviation about 0.055mm. The manufacturer tries to evaluate whether the two standard deviations for bolts produced in factory A and B are equal. The value for the testing statistics and corresponding distribution should be: (5%)
 (A) 0.73 ; $F_{9,11}$ (B) 0.73 ; $F_{11,9}$ (C) 0.85 ; χ^2_{19} (D) 0.73 ; χ^2_{19}

II. Calculation (50%)

1. $f(X) = \frac{2}{9}(X + 1)$, $-1 < X < 2$, if $Y = X^2$, please find the p.d.f of Y . (5%)
2. Suppose that T, the time to failure (in hours), of an ATM, has the following p.d.f.: (5%)

$$f(t) = \begin{cases} \beta e^{-\beta(t-t_0)} & t > t_0 > 0 \\ 0 & \text{otherwise} \end{cases}$$

Suppose that n items are tested and the failure times T_1, T_2, \dots, T_n are recorded. Assuming that t_0 is known, obtain the ML estimate of β .

3. A company sells three items: swimming pools, spas, and saunas. The survey data, the cell means, the figure of interaction between the ages of the sales people and the products, and ANOVA table are listed as follows. The owner decides to see whether the age of the sales representative and the type of item affect monthly sales. At $\alpha = 0.05$, analyze the data shown, using a two-way ANOVA. Sales are given in hundreds of dollars for a randomly selected month, and five salespeople were selected for each group.

Age of Salesperson	Product		
	Pool	Spa	Sauna
Over 30	56, 23, 52, 28, 35	43, 25, 16, 27, 32	47, 46, 52, 64, 74
30 or under	16, 14, 18, 27, 31	58, 62, 68, 75, 83	15, 14, 22, 16, 27

The cell means

Age \ Product	Pools	Spas	Saunas
Over 30	38.8	28.6	55.4
30 or under	21.2	68.6	18.8

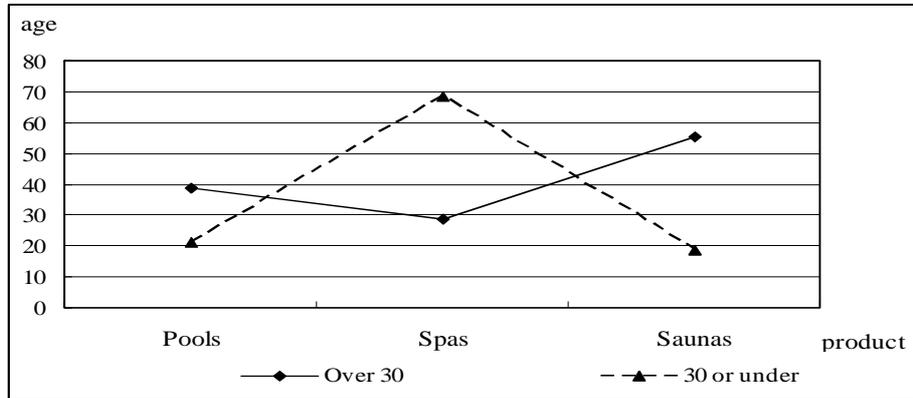
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The figure of interaction between the ages of the sales people and the products



Analysis of Variance

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Square	F
Age	168.033	(1)	(6)	(10)
Product	1,762.067	(2)	(7)	(11)
Interaction	7,955.267	(3)	(8)	(12)
Within	2,574.000	(4)	(9)	
Total	12,459.367	(5)		

- Fill out the blanks (1) ~ (12) in this ANOVA tables. (5%)
- Whether is there difference in the means of the monthly sales of the two age groups or not? (5%)
 (Hint: Please state the hypotheses, find the critical value and get the test value, make your decision and summarize the results.)
- Whether is there difference in the means of the monthly sales of the two product groups or not? (5%)
- Whether is there interaction effect between the ages of the sales people and the products they sell on the monthly sales or not? (5%)
- According to the figure of interaction effect between the ages of the sales people and the products, please describe the interaction more clearly. (5%)

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Some critical values are used to test these hypotheses.

$$F_{1,24;0.05} = 4.26, F_{24,1;0.05} = 249.1, F_{1,24;0.025} = 5.72, F_{24,1;0.025} = 997.2$$

$$F_{2,24;0.05} = 3.40, F_{24,2;0.05} = 19.45, F_{2,24;0.025} = 4.32, F_{24,2;0.025} = 39.46$$

$$\chi^2_{4;0.05} = 9.488, \chi^2_{5;0.05} = 11.071, \chi^2_{6;0.05} = 12.592, \chi^2_{7;0.05} = 14.067$$

$$\chi^2_{4;0.025} = 11.143, \chi^2_{5;0.025} = 12.833, \chi^2_{6;0.025} = 14.449, \chi^2_{7;0.025} = 16.013$$

$$Z_{0.025} = -1.96, Z_{0.05} = -1.645, Z_{0.95} = 1.645, Z_{0.975} = 1.96$$

$$t_{40,0.025} = -2.021, t_{40;0.05} = -1.684, t_{40;0.95} = 1.684, t_{40;0.975} = 2.021$$

4. Suppose that a linear regression model is

$$Y_i = \beta_0 + \beta_1 X_i + \varepsilon_i,$$

where ε_i $i = 1, 2, \dots, n$ are independent identical distribution from $f(\varepsilon)$ with mean

$$E(\varepsilon) = \lambda.$$

a. Please derive the estimators of β_0 and β_1 . (5%)

b. Are the estimators of β_0 and β_1 unbiased? (5%)

c. If the residuals are i.i.d. from the distribution $f(\varepsilon) = \frac{1}{\lambda} e^{-\frac{\varepsilon}{\lambda}}$ where $\varepsilon > 0$, please find the estimator of λ . (Hint: Use MLE to obtain the estimator) (5%)

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1. Explain the difference between Gross Domestic Product (GDP) and National Income (10 points)
2. Show graphically and explain the effect of an increase in net exports on the open-economy IS curve. (10 points)
3. Define nominal exchange rate and real exchange rate. Explain the relative advantages and disadvantages of flexible exchange rates and fixed exchange rates? (15 points)
4. Describe and list the macroeconomic determinants affecting money demand. (15 points)
5. Suppose that there are two goods in the market. Please apply the income elasticity to prove if one good is an inferior good, the other good must be a luxury good. (10 points)
6. In the Cournot model of Duopoly, let q_1 and q_2 denote quantities produced by firms 1 and 2. $P(Q) = a - Q$ is the market-clearing price and the aggregate quantity in the market is $Q = q_1 + q_2$. The total cost to firm i of producing quantity q_i is $C_i(q_i) = cq_i$. (15 points)
 - (a) Each firm would like to be a monopolist in the market. Please find the monopoly quantity of the firm 1.
 - (b) By firms 1 and 2 reaction functions, why is the monopoly quantity of the firm 1 unstable in the Cournot model?
7. June has two children named Mary and John and she loves her children equally. June has a total of \$1,000 to give them. (15 points)
 - (a) Suppose that June utility function is $U(X, Y) = \log X + \log Y$, where X is the amount of the money June gives to Mary and Y is the amount of the money June gives to John. How will June choose to divide the money?
 - (b) Suppose that June utility function is $U(X, Y) = \max \{X, Y\}$. How will June choose to divide the money?
 - (c) Suppose that June utility function is $U(X, Y) = X^2 + Y^2$. How will June choose to divide the money?
8. A firm has two variable inputs and a production function $f(x_1, x_2) = \sqrt{2x_1 + 4x_2}$. Suppose that the price of the output is 4, the price of input 1 is 2, and the price of input 2 is 3. What are the profit-maximizing amount of factor 1, the profit-maximizing amount of factor 2, and the profit-maximizing output? (10 points)