

國立政治大學 九十七學年度 碩士班暨碩士在職專班招生考試 命題紙

4171

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考試科目	財務管理	所別	財務管理研究所	考試時間	3月16日 星期日	第一節
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I. 單選題 (總分:45%, 每題:3%)

- The opportunity cost of capital for a risky project is
 - The expected rate of return on a government security having the same maturity as the project
 - The expected rate of return on a well-diversified portfolio of common stocks
 - The expected rate of return on a portfolio of securities of similar risks as the project
 - The expected rate of return on a firm with similar cash flows as the project
- Ms. Lee has just taken out a \$150,000 mortgage at an interest rate of 6% per year. If the mortgage calls for equal monthly payments for twenty years, what is the amount of each payment? (Assume monthly compounding or discounting.)
 - \$ 1074.65
 - \$ 1254.70
 - \$ 1263.06
 - \$ 1375.00
- Marison Corporation is expected to pay a dividend of \$5 per share next year, and the dividends pay out ratio is 50%. If the dividends are expected to grow at a constant rate of 8% forever and the required rate of return on the stock is 13%, calculate the present value of the growth opportunity.
 - \$76.92
 - \$62.50
 - \$38.46
 - \$23.08
- Jonson Corporation has just paid a dividend of \$0.40 per share. The dividends are expected to grow at 30% per year for the next two years and at 5% per year thereafter. If the required rate of return in the stock is 15% (APR), calculate the current value of the stock.
 - \$ 1.42
 - \$ 4.00
 - \$ 5.37
 - \$ 6.33

5. For the following projects:

A	B	C	D	E	F	G	
5.0	4.0	5.0	1.0	2.0	7.0	8.0	Initial investment
1.5	-0.5	1.0	0.5	0.5	1.0	1.0	NPV

The firm has only twenty million to invest. What is the maximum NPV that the company can obtain?

- 4.5
- 4.0
- 3.5
- 3.0

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6. Which of the following cash flows should be treated as incremental flows when deciding whether to go ahead with an electric car project?
- The cost of research and development undertaken for developing the electric car in the past three years
 - The annual depreciation charge
 - The reduction in taxes resulting from the depreciation charges
 - Dividend payments
7. Naf Calculator Company proposes to invest \$9 million in a new calculator making plant. Fixed costs are \$2 million a year. A calculator costs \$8 per unit to manufacture and can be sold for \$24 per unit. If the plant lasts for 4 years and the cost of capital is 20%, what is the break-even level of annual rates? (Assume no taxes.)
- 217,500 units
 - 342,290 units
 - 125,000 units
 - None of the above
8. If the capital markets are efficient, then the sale or purchase of any security at the prevailing market price is:
- Always a positive NPV transaction
 - Generally a zero NPV transaction
 - Always a negative NPV transaction
 - Unsure about the value of NPV
9. The Renta Corporation has 1,000,000 shares outstanding at \$30/share. The firm wishes to raise \$13.5 million at a subscription price of \$27/share through right offerings. What is the value of a right?
- \$3/right
 - \$2/right
 - \$1.5/right
 - \$1/right
10. The indifference proposition regarding dividend policy:
- Assumes that tax rates increase at the same rate as inflation
 - Assumes that investors are indifferent about the timing of dividend payments
 - States that investors are indifferent between stock dividends and cash dividends
 - States that investors are indifferent between stock repurchase and cash dividends

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11. GPT Company is financed entirely by common stock which is priced to offer a 15% expected return. If the company repurchases 25% of the common stock and substitutes an equal value of debt yielding 6%, what is the expected return on the common stock after refinancing? (Assume risk and expected return are unaffected by refinancing. Ignore taxes.)

- A) 18%
- B) 21%
- C) 15%
- D) 12.75%

12. The pecking order theory of capital structure implies that:

- (I) Risky firms will end up borrowing more
- (II) Firms prefer internal finance
- (III) Firms prefer debt to equity when external financing is required

- A) I only
- B) II only
- C) II and III only
- D) III only

13. A firm is using \$30 million in debt, \$10 million in preferred stock and \$60 million in common equity to finance its assets. If the before tax cost of debt is 8%, cost of preferred stock is 10%, and the cost of common equity is 15%; calculate the average cost of capital for the firm assuming a tax rate of 35%.

- A) 12.4%
- B) 12.56%
- C) 11.56%
- D) 11.40%

14. Tech Com announces a major expansion into Internet services. This announcement causes the price of Tech Com stock to increase, but also causes an increase in price volatility of the stock. Which of the following correctly identifies the impact of these changes on the existing call option of Tech Com?

- A) Both changes cause the price of the call option to increase
- B) Both changes cause the price of the call option to decrease
- C) The greater uncertainty will cause the price of the call option to decrease. The higher price of the stock will cause the price of the call option to increase
- D) The greater uncertainty will cause the price of the call option to increase. The higher price of the stock will cause the price of the call option to decrease

15. The value of a bond that has a probability of default is given by:

- (I) bond value = asset value - value of call option on assets
- (II) bond value = value of an equivalent default-free bond - value of put option on assets
- (III) bond value = value of an equivalent default-free bond + value of put option on assets
- (IV) bond value = asset value + value of call option on assets

- A) I only
- B) I and II only
- C) III and IV only
- D) IV only

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II.
Jack Company must choose between two types of machines. Machine A costs \$600,000, will last for 5 years, and will require \$60,000 in maintenance each year. Machine B costs \$750,000 and will last for seven years and will require \$30,000 in maintenance each year. Maintenance costs for machines A and B are incurred at the end of each year. The appropriate discount rate is 12% per year. Which machine should Jack Company purchase? Why? (10%)

III.
The market value of Mix Corporation's common stock is \$20 million, and the market value of its risk-free debt is \$5 million. The beta of the company's common stock is 0.7875, and the market risk premium is 10%. The treasury bill rate is 5% and the corporate tax rate is 30%. Mix is going to invest a project that requires an initial outlay of \$200,000 and is expected to produce a cash flow before taxes of 120,000 per year for two years. [i.e. cash flows will occur at $t = 1$ and $t = 2$]. The assets will be depreciated using MACRS - 3 year schedule : ($t=1, 33%$); ($t = 2: 45%$); ($t = 3: 15%$); ($t = 4: 7%$). The company's tax situation is such that it can make use of all applicable tax shields. Assume that the asset can be sold for book value. What is the NPV of this project? (round up to integer numbers) (20%)

IV.
Petroleum Inc. owns a lease to extract crude oil from sea. The lease costs \$20 million today and expects to produce 200,000 bbl per year forever. The extraction cost is \$8/bbl. The price of oil P is \$20/bbl in the first year. The risk-free rate is 10% per year which is also the cost of capital. The oil price is uncertain and can be \$30/bbl or \$10/bbl with the same probability next year. Should the company extract crude oil today or postpone by one year? Why? (Ignore taxes) (25%)

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第 / 頁，共 6 頁

考試科目	會計學	所別	財務管理學系 4121	考試時間	3月16日 星期日	第 一 節
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共有6頁，共有 25題選擇題，每題四分，單選題

本科目之選擇題請在答案卡上作答

- (1). Which of the following is *not* true?
- The imprest petty cash system in effect adheres to the rule of disbursement by check.
 - Entries are made to the Petty Cash account only to increase or decrease the size of the fund or to adjust the balance if not replenished at year-end.
 - The Petty Cash account is debited when the fund is replenished.
 - All of these are not true.
 - None of the above
- (2). At the close of its first year of operations, December 31, 2007, Linn Company had accounts receivable of \$540,000, after deducting the related allowance for doubtful accounts. During 2007, the company had charges to bad debt expense of \$90,000 and wrote off, as uncollectible, accounts receivable of \$40,000. What should the company report on its balance sheet at December 31, 2007, as accounts receivable before the allowance for doubtful accounts?
- \$670,000
 - \$590,000
 - \$490,000
 - \$440,000
 - None of the above
- (3). Cross Co. accepted delivery of merchandise which it purchased on account. As of December 31, Cross had recorded the transaction, but did not include the merchandise in its inventory. The effect of this on its financial statements for December 31 would be
- net income, current assets, and retained earnings were understated.
 - net income was correct and current assets were understated.
 - net income was understated and current liabilities were overstated.
 - net income was overstated and current assets were understated.
 - None of the above
- (4). Which of the following statements is not true as it relates to the dollar-value LIFO inventory method?
- It is easier to erode LIFO layers using dollar-value LIFO techniques than it is with specific goods pooled LIFO.
 - Under the dollar-value LIFO method, it is possible to have the entire inventory in only one pool.
 - Several pools are commonly employed in using the dollar-value LIFO inventory method.
 - Under dollar-value LIFO, increases and decreases in a pool are determined and measured in terms of total dollar value, not physical quantity.
 - None of the above
- (5). Erin Company exchanged an old machine, with a book value of \$39,999 and a fair market value of \$35,000, and paid \$10,000 cash for a similar new machine. The transaction has commercial substance. At what amount should the machine acquired in the exchange be recorded on Erin's books?
- \$45,000.
 - \$46,000.
 - \$49,000.
 - \$50,000
 - None of the above.
- (6). On August 1, 2007, Tanner Corporation purchased a new machine on a deferred payment basis. A down

備 考 試 題 隨 卷 繳 交

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payment of \$2,000 was made and 4 annual installments of \$6,000 each are to be made beginning on September 1, 2007. The cash equivalent price of the machine was \$23,000. Due to an employee strike, Tanner could not install the machine immediately, and thus incurred \$300 of storage costs. Costs of installation (excluding the storage costs) amounted to \$800. The amount to be capitalized as the cost of the machine is

- a. \$23,000.
- b. \$23,800.
- c. \$24,100.
- d. 26,000
- e. None of the above.

(7). Weston Company purchased a tooling machine on January 3, 2000 for \$500,000. The machine was being depreciated on the straight-line method over an estimated useful life of 10 years, with no salvage value. At the beginning of 2007, the company paid \$125,000 to overhaul the machine. As a result of this improvement, the company estimated that the useful life of the machine would be extended an additional 5 years (15 years total). What should be the depreciation expense recorded for the machine in 2007?

- a. \$34,375
- b. \$41,667
- c. \$50,000
- d. \$55,000
- e. None of the above

(8). Turner Company's 12/31/08 balance sheet reports assets of \$6,000,000 and liabilities of \$2,500,000. All of Turner's assets' book values approximate their fair value, except for land, which has a fair value that is \$400,000 greater than its book value. On 12/31/08, Benedict Corporation paid \$6,100,000 to acquire Turner. What amount of goodwill should Benedict record as a result of this purchase?

- a. \$ -0-
- b. \$ 100,000
- c. \$2,200,000
- d. \$2,600,000
- e. None of the above

(9). Neer Company sells 2,000 units of its product for \$500 each. The selling price includes a one-year warranty on parts. It is expected that 3% of the units will be defective and that repair costs will average \$50 per unit. In the year of sale, warranty contracts are honored on 40 units for a total cost of \$2,000. What amount will be reported on Neer Company's balance sheet as Estimated Warranty Liability on December 31, 2008?

- a. \$2,000
- b. \$3,000
- c. \$1,000
- d. It cannot be determined.
- e. None of the above

(10) Partners Abel and Cain have capital balances in a partnership of \$40,000 and \$60,000, respectively. They agree to share profits and losses as follows:

	Abel	Cain
As salaries	\$10,000	\$12,000
As interest on capital at the beginning of the year	10%	10%
Remaining profits or losses	50%	50%

If net loss for the year was \$2,000, what will be the distribution to Cain?

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- a. \$12,000 income
- b. \$1,000 income
- c. \$1,000 loss
- d. \$2,000 loss
- e. None of the above

- (11). Lowe is admitted to a partnership with a 25% capital interest by a cash investment of \$120,000. If total capital of the partnership is \$520,000 before admitting Lowe, the bonus to Lowe is
- a. \$40,000.
 - b. \$20,000.
 - c. \$60,000.
 - d. \$80,000
 - e. None of the above.
- (12). Renfro Corporation started business in 1999 by issuing 200,000 shares of \$20 par common stock for \$36 each. In 2004, 20,000 of these shares were purchased for \$52 per share by Renfro Corporation and held as treasury stock. On June 15, 2008, these 20,000 shares were exchanged for a piece of property that had an assessed value of \$810,000. Renfro's stock is actively traded and had a market price of \$60 on June 15, 2008. The cost method is used to account for treasury stock. The amount of paid-in capital from treasury stock transactions resulting from the above events would be
- a. \$800,000.
 - b. \$480,000.
 - c. \$390,000.
 - d. 160,000
 - e. None of the above.
- (13). Dividends in arrears on cumulative preferred stock
- a. are considered to be a non-current liability.
 - b. are considered to be a current liability.
 - c. only occur when preferred dividends have been declared.
 - d. should be disclosed in the notes to the financial statements
 - e. none of the above

Use the following information for questions 14-15.

Starr Corporation's December 31, 2008 Balance Sheet showed the following:

8% preferred stock, \$20 par value, cumulative, 20,000 shares authorized; 10,000 shares issued	\$ 200,000
Common stock, \$10 par value, 2,000,000 shares authorized; 1,300,000 shares issued, 1,280,000 shares outstanding	13,000,000
Paid-in capital in excess of par value - preferred stock	40,000
Paid-in capital in excess of par value - common stock	18,000,000
Retained earnings	5,100,000
Treasury stock (10,000 shares)	420,000

- (14). Starr's total paid-in capital was
- a. \$31,240,000.
 - b. \$31,660,000.
 - c. \$30,820,000.
 - d. \$18,040,000

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命題委員：	(簽章) <i>wuf</i> 年 3 月 7 日

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- e None of the above
- (15). Starr's total stockholders' equity was
- \$36,760,000.
 - \$31,240,000.
 - \$36,340,000.
 - 35920,000
 - none of the above .
- (16). The book value per share
- is usually a close approximation of the market price per share.
 - is the same as the par value per share.
 - may be useful in determining the trend of a stockholder's per share equity in a corporation.
 - always falls within the annual range of a company's market value per share.
 - None of the above
- (17). Lopez, Inc. has 2,000 shares of 6%, \$50 par value, cumulative preferred stock and 50,000 shares of \$1 par value common stock outstanding at December 31, 2007, and December 31, 2008. The board of directors declared and paid a \$4,000 dividend in 2007. In 2008, \$20,000 of dividends are declared and paid. What are the dividends received by the preferred and common shareholders in 2008?
- | | <u>Preferred</u> | <u>Common</u> |
|----|---------------------|---------------|
| a. | \$12,000 | \$8,000 |
| b. | \$10,000 | \$10,000 |
| c. | \$8,000 | \$12,000 |
| d. | \$6,000 | \$14,000 |
| e. | none of the above . | |
- (18). The stockholders' equity section of Lawton Corporation as of December 31, 2006, was as follows:
- | | |
|--|------------------|
| Common stock, par value \$2; authorized 20,000 shares;
issued and outstanding 10,000 shares | \$ 20,000 |
| Paid-in capital in excess of par | 30,000 |
| Retained earnings | <u>75,000</u> |
| | <u>\$125,000</u> |
- On March 1, 2007, the board of directors declared a 15% stock dividend, and accordingly 1,500 additional shares were issued. On March 1, 2007, the fair market value of the stock was \$6 per share. For the two months ended February 28, 2007, Lawton sustained a net loss of \$10,000.
- What amount should Lawton report as retained earnings as of March 1, 2007?
- \$56,000.
 - \$62,000.
 - \$66,000.
 - \$72,000
 - none of the above.
- (19). At December 31, 2007 Polk Company had 300,000 shares of common stock and 10,000 shares of 5%, \$100 par value cumulative preferred stock outstanding. No dividends were declared on either the preferred or common stock in 2007 or 2008. On January 30, 2009, prior to the issuance of its financial statements for the year ended December 31, 2008, Polk declared a 100% stock dividend on its common stock. Net income for 2008 was \$950,000. In its 2008 financial statements, Polk's 2008 earnings per common share should be

備	考試 題 隨 卷 繳 交
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a. \$1.50.
b. \$1.58.
c. \$3.00.
d. \$3.17
e. none of the above.

Use the following information for questions (20)–(22).

Golden Company received proceeds of \$94,250 on 10-year, 8% bonds issued on January 1, 2007. The bonds had a face value of \$100,000, pay interest semi-annually on June 30 and December 31, and have a call price of 101. Golden uses the straight-line method of amortization.

(20). What is the amount of interest expense Golden will show with relation to these bonds for the year ended December 31, 2008?
a. \$8,000
b. \$7,540
c. \$8,575
d. \$7,425
e. none of the above

(21). What is the carrying value of the bonds on January 1, 2009?
a. \$100,000
b. \$95,400
c. \$98,850
d. \$94,825
e. none of the above.

(22). Golden Company decided to redeem the bonds on January 1, 2009. What amount of gain or loss would Golden report on its 2009 income statement?
a. \$4,600 gain
b. \$5,600 gain
c. \$5,600 loss
d. \$4,600 loss
e. none of the above.

(23). On January 2, Matthews Corporation acquired 20% of the outstanding common stock of Dennehy Company for \$450,000. For the year ended December 31, Dennehy reported net income of \$90,000 and paid cash dividends of \$30,000 on its common stock. At December 31, the carrying value of Matthews' investment in Dennehy under the equity method is
a. \$444,000.
b. \$450,000.
c. \$456,000.
d. 462,000
e. none of the above..

Use the following information for questions (24) and (25).

Marten Co. purchased \$500,000 of 8%, 5-year bonds from Duggan, Inc. on January 1, 2008, with interest payable on July 1 and January 1. The bonds sold for \$520,790 at an effective interest rate of 7%. Using the effective-interest method, Marten Co. decreased the Available-for-Sale Debt Securities account for the Duggan, Inc. bonds on July 1, 2008 and December 31, 2008 by the amortized premiums of \$1,770 and

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國立政治大學 九十七學年度 碩士班暨碩士在職專班招生考試 命題紙

第 6 頁，共 6 頁

考試科目	會計學	所別	財務管理學系 4/7/	考試時間	3月16日 星期日	第 一 節
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\$1,830, respectively.

- (24). At December 31, 2008, the fair value of the Duggan, Inc. bonds was \$530,000. What should Marten Co. report as other comprehensive income and as a separate component of stockholders' equity?
- \$13,810.
 - \$9,210.
 - \$3,600.
 - No entry should be made.
 - none of the above.
- (25). At April 1, 2009, Marten Co. sold the Duggan bonds for \$515,000. After accruing for interest, the carrying value of the Duggan bonds on April 1, 2009 was \$516,875. Assuming Marten Co. has a portfolio of Available-for-Sale Debt Securities, what should Marten Co. report as a gain or loss on the bonds?
- (\$14,685).
 - (\$10,935).
 - (\$1,875).
 - \$0
 - none of the above.



備	考試題隨卷繳交
命題委員：	(簽章) <i>WFB</i> 年 3 月 7 日

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考試科目	經濟學	所別	財務管理學系 4171	考試時間	3 月 16 日 星期日	第 一 節
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1. State whether the following are True (T) or False (F). Your answer **must** also have enough supporting explanation that is consistent with your choice.
 - a) (5 points) Without the presence of speculative bubbles, the current price of the stock should be equal to the sum of the present value of its future dividend payments.
 - b) (5 points) With freer capital mobility and less trade barriers, the workers in the rich countries will suffer lower real wage rates than before because of globalization.
 - c) (5 points) Assuming that the economy is at the natural level of output, a tax-cut will boost the output in the long run.
 - d) (5 points) The IS curve is downward sloping because higher output results in higher savings.
 - e) (5 points) Hyperinflations distort prices, but they have no effect on real output.

2. Imagine you are playing a role as a member of Board of Governors of the *Federal Reserve System*, such that you have the right to attend the *Federal Open Market Committee* meeting to affect monetary policy by changing the federal funds rate (the policy tool you possess is to change the interest rates via the federal funds rate). During the March meeting, members discuss the following three issues:
 - a. the prospect of an upcoming recession, if they are not already in one,
 - b. the spiking oil price, and
 - c. the liquidity shortage generated by the subprime mortgage crisis.
 - a) (15 points) Please tell me what your suggestions are for solving each problem and why you think so.
 - b) (5 points) At the mean time, European Central Bank and the Bank of Japan haven't touched rates since credit problems emerged last year. The Reserve Bank of Australia and Central Bank of Taiwan have been even raising rates. How will you predict the trend of exchange rate movements between U.S. dollar and the other currencies? Please explain your prediction with theories connecting to this problem.

3. Suppose that the market for textbooks in the National Chengchi University neighborhood is represented by the following market demand curve: $Q = 60 - P$
 - a) (8 points) Further suppose that the University Bookstore is the only bookstore in the neighborhood (so that it is a monopolist) and that the total cost curve of the bookstore is represented by the following function: $C(Q) = (1/2)Q^2 + 100$. How many books will the bookstore choose to sell? What will be the price of those textbooks? What are the profits of the bookstore? Illustrate your answer in a diagram.
 - b) (8 points) Suppose that a second bookstore may open across the street from the University Bookstore and that the new bookstore has an identical total cost curve. If the new bookstore decides to open then the next decision it makes will be how many books it would like to sell. Suppose that it can sell **either 15 or 30** books. After observing the new bookstore's choice of quantity the University Bookstore must choose a quantity of books to sell and it can also choose **either 15 or 30** books. The

備 考 試 題 隨 卷 繳 交

命 題 委 員 :

(簽章) 2008 年 3 月 7 日

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考試科目	經濟學	所別	財務管理學系 417	考試時間	3 月 16 日 星期日	第 一 節
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books they sell are identical and the prices are the same. If the University bookstore sells 30 books then will the new bookstore be able to earn positive profits? Can the University Bookstore credibly commit to selling 30 books? What will be the profits of the two firms in the backward induction solution?

c) (4 points) Finally suppose that before the new bookstore opens it must obtain a permit from the government. If the University Bookstore pays the government \$200 to maintain its monopoly power then the new store will not be awarded a permit. If the University Bookstore does not pay that \$200 then the government will grant the new bookstore the permit. Will the University Bookstore pay the \$200 fee? If the government can only gather the "tax revenue" from this monopoly charter fee (no sales tax in this question), what is the highest amount they can possibly collect?

4. Susan is planning a trip to Paris and she has allocated \$80 of her vacation budget to spend on entrance fees to museums and monuments. Her preferences over bundles of museum visits (x) and monument visits (y) can be represented by the utility function $U(x, y) = 4 \ln x + 0.5 y$. The price of admission to a museum is P_x and the price of admission to a monument is P_y .

a) (8 points) Find Susan's demand functions for museum and monument visits.

b) (4 points) Suppose that the price of admission to a museum is \$10 and the price of admission to a monument is \$5. What are Susan's demands for museum and monument visits? What is the (own price) elasticity of Susan's demand for museum visits at these prices?

c) (3 points) Suppose that the price of admission to a museum falls to \$8. What are Susan's demands for museum and monument visits?

d) (10 points) Putting museum visits on the x -axis and monument visits on the y -axis, illustrate in an indifference curve diagram of Susan's optimal choice of museum and monument visits when the prices of each are \$10 and \$5 respectively.

Illustrate in your diagram the effect of the decrease in the price of admission to museums (from \$10 to \$8) on her demands for museum and monument visits. Make sure to clearly indicate the **income** and **substitution** effects in your diagram for both activities. Which effect (the income or substitution) is larger on her demand for **museum** visits?

5. (10 points) The United States embargo against Cuba forbids imports of Cuban cigars into the country. American people can still get hold on those products through black market transactions, but they have to pay higher prices than European pay for the same products. With Fidel Castro stepped down last month, there is a chance that the U.S. might lift the long-lasting embargo in the future. If that happens, please predict how the prices of Cuban cigars will change in the U.S. and Europe, and how the wages of Cuban cigar workers will be affected. Please also write down the assumptions you use in the analysis explicitly.

備	考試題隨卷繳交
命題委員：	(簽章) 2008 年 3 月 7 日

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國立政治大學九十七學年度研究所^博士班入學考試命題紙

第一頁，共四頁

考試科目	統計學	所別	財研所 4171	考試時間	3月16日 星期日	第3節
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1. (15%) A small town has a "Pick 3" game in which you pick one of the 1000 3-digit numbers between 000 and 999, receiving \$2750 for a winning \$10 bet and nothing otherwise.
 - (1) (5%) Construct the probability distribution of the random variable $X =$ winnings.
 - (2) (6%) Find the mean and variance of the probability distribution.
 - (3) (4%) Based on part (2) and the \$10 cost to play the game, on average, how much can you expected to lose each time you play this lottery?

2. (30%) A fast-food chain wants to compare two ways of promoting a new turkey burger. One way uses a coupon available in the store. The other way uses a poster display outside the store. Before the promotion, their marketing research group matches 50 pairs of stores. Each pair has two stores with similar sales volume and customer demographics. The store in a pair that uses coupons is randomly chosen, and after a month-long promotion, the increases in sales of the turkey burger are compared for the two stores.
 - (1) (8%) The increase was higher for 28 stores using coupons and higher for 22 stores using the poster. Is this strong evidence to support the coupon approach? Make a decision using a 0.05 significance level.
 - (2) (6%) Find and interpret the P -value for this test.
 - (3) (8%) In a separate experiment with 10 pairs of stores, the difference in the month's increased sales between the store that used coupons and the store with outside poster had a mean of \$3000 and standard deviation \$4000. Does this indicate a true difference between mean sales for the two advertising approaches? Make a decision using a 0.05 significance level.
 - (4) (8%) Refer to part (2). Please first construct a 95% confidence interval for the difference between mean sales for the two advertising approaches, and then compare this result with that of part (3).

備考	試題隨卷繳交
命題委員：	(簽章) 年 月 日

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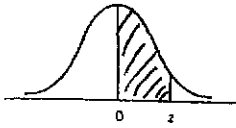
考試科目	統計學	所別	研究所 4171	考試時間	3月16日 星期四	第3節																
<p>3. (20%) A tax assessor wants to estimate the mean property tax bill for all homeowners in a small town. A survey ten years ago got a sample mean and standard deviation of \$1400 and \$1000, respectively.</p> <p>(1) (6%) How many tax records should the tax processor randomly sample in order for a 95% confidence interval for the mean to have a margin error equal to \$100?</p> <p>(2) (7%) In reality, suppose that they'd now got a standard deviation equal to \$1500. Using the sample size you derived in part (1), please find the margin of error. Explain whether and why this margin of error would be less \$100, equal to \$100, or more than \$100.</p> <p>(3) (7%) Refer to part (2). What is the probability that the sample mean falls within \$100 of the population mean? Explain whether and why this probability would be less 0.95, equal to 0.95, or more than 0.95.</p> <p>4. (15%) A report summarizing scores for students on a verbal aptitude test x and mathematics aptitude test y states that $\bar{x} = 480$, $\bar{y} = 500$, $s_x = 80$, $s_y = 120$, and $r = 0.60$. Here \bar{x} and s_x denote the sample mean and standard deviation of x, respectively, and r is the sample correlation coefficient of x and y.</p> <p>(1) (10%) Find the intercept and slope of the regression line, and state the prediction equation.</p> <p>(2) (5%) Compute the value of R^2 and interpret it.</p> <p>5. (20%) Consider the following data.</p> <table style="margin-left: auto; margin-right: auto;"> <tr> <td>A</td> <td>27</td> <td>31</td> <td>31</td> <td>29</td> <td>30</td> <td>27</td> <td>28</td> </tr> <tr> <td>B</td> <td>22</td> <td>27</td> <td>25</td> <td>23</td> <td>26</td> <td>27</td> <td>23</td> </tr> </table> <p>(1) (15%) Please first carry out a one-way analysis of variance (ANOVA) analysis for these data, and then make a decision for the resulting ANOVA table using a 0.05 significance level.</p> <p>(2) (5%) What assumptions are required to carry out part (1)?</p>							A	27	31	31	29	30	27	28	B	22	27	25	23	26	27	23
A	27	31	31	29	30	27	28															
B	22	27	25	23	26	27	23															
備考	試題隨卷繳交																					
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國立政治大學九十七 學年度研究所 ^博碩 士班入學考試命題紙

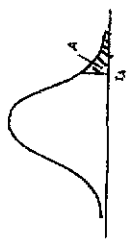
考試科目	統計學	所別	財管 4171	考試時間	3月16日 星期日	第3節
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Normal Probabilities



z	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
0.0	.0000	.0040	.0080	.0120	.0160	.0199	.0239	.0279	.0319	.0359
0.1	.0398	.0438	.0478	.0517	.0557	.0596	.0636	.0675	.0714	.0753
0.2	.0793	.0832	.0871	.0910	.0948	.0987	.1026	.1064	.1103	.1141
0.3	.1179	.1217	.1255	.1293	.1331	.1368	.1406	.1443	.1480	.1517
0.4	.1554	.1591	.1628	.1664	.1700	.1736	.1772	.1808	.1844	.1879
0.5	.1915	.1950	.1985	.2019	.2054	.2088	.2123	.2157	.2190	.2224
0.6	.2257	.2291	.2324	.2357	.2389	.2422	.2454	.2486	.2517	.2549
0.7	.2580	.2611	.2642	.2673	.2704	.2734	.2764	.2794	.2823	.2852
0.8	.2881	.2910	.2939	.2967	.2995	.3023	.3051	.3078	.3106	.3133
0.9	.3159	.3186	.3212	.3238	.3264	.3289	.3315	.3340	.3365	.3389
1.0	.3413	.3438	.3461	.3485	.3508	.3531	.3554	.3577	.3599	.3621
1.1	.3643	.3665	.3686	.3708	.3729	.3749	.3770	.3790	.3810	.3830
1.2	.3849	.3869	.3888	.3907	.3925	.3944	.3962	.3980	.3997	.4015
1.3	.4032	.4049	.4066	.4082	.4099	.4115	.4131	.4147	.4162	.4177
1.4	.4192	.4207	.4222	.4236	.4251	.4265	.4279	.4292	.4306	.4319
1.5	.4332	.4345	.4357	.4370	.4382	.4394	.4406	.4418	.4429	.4441
1.6	.4452	.4463	.4474	.4484	.4495	.4505	.4515	.4525	.4535	.4545
1.7	.4554	.4564	.4573	.4582	.4591	.4599	.4608	.4616	.4625	.4633
1.8	.4641	.4649	.4656	.4664	.4671	.4678	.4686	.4693	.4699	.4706
1.9	.4713	.4719	.4726	.4732	.4738	.4744	.4750	.4756	.4761	.4767
2.0	.4772	.4778	.4783	.4788	.4793	.4798	.4803	.4808	.4812	.4817
2.1	.4821	.4826	.4830	.4834	.4838	.4842	.4846	.4850	.4854	.4857
2.2	.4861	.4864	.4868	.4871	.4875	.4878	.4881	.4884	.4887	.4890
2.3	.4893	.4896	.4898	.4901	.4904	.4906	.4909	.4911	.4913	.4916
2.4	.4918	.4920	.4922	.4925	.4927	.4929	.4931	.4932	.4934	.4936
2.5	.4938	.4940	.4941	.4943	.4945	.4946	.4948	.4949	.4951	.4952
2.6	.4953	.4955	.4956	.4957	.4959	.4960	.4961	.4962	.4963	.4964
2.7	.4965	.4966	.4967	.4968	.4969	.4970	.4971	.4972	.4973	.4974
2.8	.4974	.4975	.4976	.4977	.4977	.4978	.4979	.4979	.4980	.4981
2.9	.4981	.4982	.4982	.4983	.4984	.4984	.4985	.4985	.4986	.4986
3.0	.4987	.4987	.4987	.4988	.4988	.4989	.4989	.4989	.4990	.4990

Critical Values of t



DEGREES OF FREEDOM	$t_{.100}$	$t_{.050}$	$t_{.025}$	$t_{.010}$	$t_{.005}$
1	3.078	6.314	12.706	31.821	63.657
2	1.886	2.920	4.303	6.965	9.925
3	1.638	2.353	3.182	4.541	5.841
4	1.533	2.132	2.776	3.747	4.604
5	1.476	2.015	2.571	3.365	4.032
6	1.440	1.943	2.447	3.143	3.707
7	1.415	1.895	2.365	2.998	3.499
8	1.397	1.860	2.306	2.896	3.355
9	1.383	1.833	2.262	2.821	3.250
10	1.372	1.812	2.228	2.764	3.169
11	1.363	1.796	2.201	2.718	3.106
12	1.356	1.782	2.179	2.681	3.055
13	1.350	1.771	2.160	2.650	3.012
14	1.345	1.761	2.145	2.624	2.977
15	1.341	1.753	2.131	2.602	2.947
16	1.337	1.746	2.120	2.583	2.921
17	1.333	1.740	2.110	2.567	2.898
18	1.330	1.734	2.101	2.552	2.878
19	1.328	1.729	2.093	2.539	2.861
20	1.325	1.725	2.086	2.528	2.845
21	1.323	1.721	2.080	2.518	2.831
22	1.321	1.717	2.074	2.508	2.819
23	1.319	1.714	2.069	2.500	2.807

備考 試題隨卷繳交

命題委員： (簽章) 年 月 日

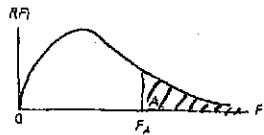
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國立政治大學九十年度研究所碩士班入學考試命題紙

第四頁，共四頁

考試科目	統計學	所別	研究所 A11	考試時間	3月16日 第3節
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Critical Values of F: $\alpha = .05$



ν_2	ν_1	NUMERATOR DEGREES OF FREEDOM								
		1	2	3	4	5	6	7	8	9
1	1	161.4	199.5	215.7	224.6	230.2	234.0	236.8	238.9	240.5
2	1	18.51	19.00	19.16	19.25	19.30	19.33	19.35	19.37	19.38
3	1	10.13	9.55	9.28	9.12	9.01	8.94	8.89	8.85	8.81
4	1	7.71	6.94	6.59	6.39	6.26	6.16	6.09	6.04	6.00
5	1	6.61	5.79	5.41	5.19	5.05	4.95	4.88	4.82	4.77
6	1	5.99	5.14	4.76	4.53	4.39	4.28	4.21	4.15	4.10
7	1	5.59	4.74	4.35	4.12	3.97	3.87	3.79	3.73	3.68
8	1	5.32	4.46	4.07	3.84	3.69	3.58	3.50	3.44	3.39
9	1	5.12	4.26	3.86	3.63	3.48	3.37	3.29	3.23	3.18
10	1	4.96	4.10	3.71	3.48	3.33	3.22	3.14	3.07	3.02
11	1	4.84	3.98	3.59	3.36	3.20	3.09	3.01	2.95	2.90
12	1	4.75	3.89	3.49	3.26	3.11	3.00	2.91	2.85	2.80
13	1	4.67	3.81	3.41	3.18	3.03	2.92	2.83	2.77	2.71
14	1	4.60	3.74	3.34	3.11	2.96	2.85	2.76	2.70	2.65
15	1	4.54	3.68	3.29	3.06	2.90	2.79	2.71	2.64	2.59
16	1	4.49	3.63	3.24	3.01	2.85	2.74	2.66	2.59	2.54
17	1	4.45	3.59	3.20	2.96	2.81	2.70	2.61	2.55	2.49
18	1	4.41	3.55	3.16	2.93	2.77	2.66	2.58	2.51	2.46
19	1	4.38	3.52	3.13	2.90	2.74	2.63	2.54	2.48	2.42
20	1	4.35	3.49	3.10	2.87	2.71	2.60	2.51	2.45	2.39
21	1	4.32	3.47	3.07	2.84	2.68	2.57	2.49	2.42	2.37
22	1	4.30	3.44	3.05	2.82	2.66	2.55	2.46	2.40	2.34
23	1	4.28	3.42	3.03	2.80	2.64	2.53	2.44	2.37	2.32
24	1	4.26	3.40	3.01	2.78	2.62	2.51	2.42	2.36	2.30
25	1	4.24	3.39	2.99	2.76	2.60	2.49	2.40	2.34	2.28
26	1	4.23	3.37	2.98	2.74	2.59	2.47	2.39	2.32	2.27
27	1	4.21	3.35	2.96	2.73	2.57	2.46	2.37	2.31	2.25
28	1	4.20	3.34	2.95	2.71	2.56	2.45	2.36	2.29	2.24
29	1	4.18	3.33	2.93	2.70	2.55	2.43	2.35	2.28	2.22
30	1	4.17	3.32	2.92	2.69	2.53	2.42	2.33	2.27	2.21
40	1	4.08	3.23	2.84	2.61	2.45	2.34	2.25	2.18	2.12
60	1	4.00	3.15	2.76	2.53	2.37	2.25	2.17	2.10	2.04
120	1	3.92	3.07	2.68	2.45	2.29	2.17	2.09	2.02	1.96
8	2	3.84	3.00	2.60	2.37	2.21	2.10	2.01	1.94	1.88

備考 試題隨卷繳交

命題委員： (簽章) 年 月 日

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考試科目	微積分	所別	財管所 ₄₁₇₁	考試時間	3月16日 星期A	第三節
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1. (8 points each) Evaluate the following limits.

$$(i) \lim_{\theta \rightarrow 0} \frac{\sin \theta - \tan \theta}{\theta^3} \quad (ii) \lim_{n \rightarrow \infty} n e^{-n^2} \int_0^n e^{x^2} dx$$

2. (8 points each) Evaluate the following integrals.

$$(i) \int_{-3}^3 |x^3 - x| dx \quad (ii) \int_0^{\frac{\pi}{2}} \int_0^{\frac{\pi}{2}} \cos x \sin y \, dx dy \quad (iii) \int_0^e y dx, \text{ where } e^y + y = x + 1.$$

3. (15 points) Suppose that $\lim_{x \rightarrow 2} \frac{f(x)}{x-2} = 2$, $\lim_{x \rightarrow 3} \frac{f(x)}{x-3} = 3$ and $\lim_{x \rightarrow 4} \frac{f(x)}{x-4} = 4$. Find the polynomial $f(x)$ of least degree.

4. (i) (10 points) Suppose that $x > 0$. Find the maximum of $f(x) = \frac{\ln x}{x}$.

(ii) (10 points) Apply the result of (i) to prove that $e^\pi > \pi^e$.

5. (15 points) Suppose that $y(x)$ satisfies the differential equation $x^2 y' + (3x^2 + 2)y^2 = 0$ and the initial condition $y(1) = \frac{1}{3}$. Solve $y(x)$.

6. (10 points) The marginal cost function of producing x units of widgets is given by the function $MC(x) = \frac{1}{4}x + 50$. If the total cost of producing 20 units is 1500, then determine the total cost function $C(x)$.

備 考 試 題 隨 卷 繳 交

命 題 委 員 :

(簽章) 2008 年 3 月 7 日

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