個體經濟部份（　50 分）

1. 選擇題（單選，每題 2.5 分，共 50 分）

（1）牛肉價格的單位以「元／斤」衡量時，$E_d = 0.5$；若改以「元／公斤」衡量時，則彈性為何？（提示：一斤等於 0.6 公斤）

　　（A）0.5　　　　　（B）0.83　　　　　（C）0.3　（D）以上皆非

（2）在消費者均衡下，消費者

　　（A）不會購買劣等財

　　（B）每種財貨的邊際效用要相等（即 $MU_x = MU_y$）

　　（C）每種財貨的價格要等於貨幣的邊際效用

　　（D）花在各種財貨的最後一元的邊際效用必須相等

（3）MRS_{xy} 遞增，表示無異曲線

　　（A）凸向原點　　（B）凹向原點　　（C）為一直線　　（D）為

一直角形

（4）若 ICC 呈現正斜率，則

　　（A）X 與 Y 財均為正常財　　　（B）X 與 Y 財均為劣等財

　　（C）X 與 Y 財有一種是正常財，一種是劣等財　　（D）X 與

Y 財為中性財

（5）利率上升會使跨期預算線

　　（A）變陡　　（B）變平　　（C）平行外移　　（D）平行

內移

（6）在兩期模型下，利率的上升，根據跨期替代效果，第一期的消費將會：

（A）增加　　　（B）減少　　　（C）不變　　　（D）不確定

（7）風險逃避者的 VN－M 效用函數具有下列哪個特性？

（A）貨幣的邊際效用遞減　　　（B）貨幣的邊際效用遞增

（C）貨幣的邊際效用固定　　　（D）以上皆可

（8）下列哪一個 VN－M 效用函數所對應出的相對風險測度值為固定的？

（A）$U(W) = a + bW - CW^2$　　　（B）$U(W) = \ln W$

（C）$U(W) = aW^\alpha$　　　（D）$U(W) = \alpha - e^{-\beta W}$

（9）當 $MP_L > AP_L$ 時，則

（A）AP_L 處於遞減狀態　　　（B）AP_L 處於遞增狀態

（C）AP_L 可能遞增也可能遞減　　　（D）AP_L 處於極大

（10）下列哪一個生產函數不具固定規模報酬的特性？

（A）$q = 10L^2 K^4$　　　（B）$q = 10L^{\frac{1}{2}} K^{\frac{1}{2}}$

（C）$q = 10\left[0.2L^{-2} + 0.8K^{-2}\right]^{-\frac{1}{2}}$　　　（D）$q = 2L + 4K$

（11）下列關於獨占廠商的收益函數，何者為錯？

（A）隨著銷售量的增加，廠商的總收入會增加

（B）平均收益恆大於邊際收益

（C）邊際收益恆大於平均收益

（D）市場的需求曲線便是廠商的平均收益線

（12）當勞動市場為完全競爭、產品市場為獨占時，則在均衡狀態下

（A）VMP＞MRP＝MFC＝AFC＝w

（B）VMP＝MRP＝MFC＞AFC＝w

（C）VMP＝MRP＝MFC＝AFC＝w

（D）VMP＞MRP＝MFC＞AFC＝w

（13）關於舊車市場，下列敘述何者為誤？

（A）檸檬車市場

（B）買方無法佑道舊車的真實品質

（C）最後成交的有一半是高品質車；一半是低品質車

（D）會有逆向選擇的情形發生

（14）張君投保房屋火險之前，會每年更換滅火器中之藥粉；但投保後，便五年才更換一次。張君這種行為，我們稱為

（A）逆向選擇 （B）道德危險 （C）檸檬市場 （D）以上皆是

(15) 假設高品質白蘭地的生產函數為 $q = \sqrt{K \cdot L}$，其中 q 為每週的產量，L 為每週的工時，K 固定為 100，因此短期的生產函數為 $q = 10\sqrt{L}$，假設資本的租金為每小時 10 美元，工資率為 5 美元，短期總成本應為

(A) $STC = 1,000 + 0.04q^2$ (B) $STC = 1,000 + 0.05q^2$

(C) $STC = 1,000 + 0.06q^2$ (D) $STC = 1,000 + 0.07q^2$

(16) 續(15)題，在上題中的短期總成本曲線下，短期的邊際成本為 $SMC = 0.1q$，當每瓶白蘭地的價格為 20 美元時，則產量(q)每週雇用的工時(w)等於多少？

(A) q= 150 , w= 225　　　(B) q= 150 , w= 250

(C) q= 125 , w= 250　　　(D) q= 125 , w= 225

科目：經濟學【財管系碩士班】

(17)　下表為廣告賽局的報償矩陣。下列何者是此賽局的納許均衡?

　　(A) A:高，B:高　　　　(B) A:低，B:高

　　(C) A:高，B:低　　　　(D) A:低，B:低

<center>B 的策略</center>

		高	低
A 的策略	高	A：5 B：2	A：3 B：3
	低	A：4 B：3	A：2 B：4

(18) F 先生計畫環遊世界旅遊。此趟旅遊的效用是旅遊支出（Y）的函數 $q=10\sqrt{L}$，F 先生有 1 萬美元的預算。如果他把 1 萬美元全部花在旅遊上，則效用為 $q=10\sqrt{L}$（本問題中，對數的底數為 10）. 如果 F 先生在旅遊中遺失 1 千美元的機率為 25%，則此趟旅遊的預期效用等於多少？ F 先生最多願意支付多少金額來保障損失 1 千美元的風險？

　(A) 250 美元　(B) 253 美元　(C) 256 美元　(D) 259 美元

(19) 承上(18)題，假設購買保險的人對於現金的看管會更不小心，遺失 1 千美元的機率上升至 30%，假設保險公司以精算的公平保費收取此一保險的保費，此時，此一保險將會以多少錢與 F 先生成交？

(A) 250 美元　　(B) 275 美元　　(C) 300 美元　　(D) 以上皆非

科目：經濟學【財管系碩士班】

(20)（10）某獨佔廠商面臨市場需求曲線為 $D(P) = 60 - \dfrac{P}{2}$，但它有二

家工廠，各自的成本函數為 $C_1 = 2q_1^2$；$C_2 = q_2^2$。試求各廠的產

量為何？

（A）$q_1^* = 5$，$q_2^* = 10$　　　　（B）$q_1^* = 7$，$q_2^* = 14$

（C）$q_1^* = 9.5$，$q_2^* = 19$　　　（D）$q_1^* = 10$，$q_2^* = 20$

（E）$q_1^* = 7.5$，$q_2^* = 15$

總體經濟部分

選擇題，單選，每題 2.5 分

1. 在國際收支平衡表中，有關服務業的貿易列在 A)經常帳　B)貿易帳　C)金融帳　D)資本帳

2. 依一般凱因斯模型 Y=C+I+G+X-M, C=C₀+c(Y-T₀-tY), X=X₀+aY*, M=M₀+mY, Y*為國外所得，為何政府支出擴大會降低貿易餘額？A)所得上升導致進口增加　B)政府會採購進口商品　C)政府支出增加導致稅收提高，進口關稅也提高，致進口金額增加　D)政府支出增加導致排擠效果，致民間投資衰退，出口減少

3. 若一國面臨經濟衰退，採取降稅及放寬貨幣政策，依一般 IS-LM 模型分析，下列何者最不可能因之而發生？A)消費增加　B)投資增加　C)政府支出增加　D)財政赤字增加

4. 有如下典型僵固名目工資的經濟模型
$Y = f(L), dY/dL > 0, d^2Y/dL^2 < 0$
$Y = C(Y) + I(r) + G$
$M/P = L_0 + \alpha Y - \beta r$
$\overline{W}/P = dY/dL$
依新興古典學派理論，若預知將有一貨幣供給擴張，下列何者正確？
A)貨幣供給增加完全被物價上漲抵銷　B)就業不變　C)總供給線會左移　D)總需求線會右移

5. 設 IS 線為 Y=C+I+G+X-M, C=C₀+c(Y-T₀-tY), I=I₀-βr, X=X₀+αY*, M=M₀+mY, Y*為國外所得。另有一般 LM 線。假定各係數皆為一般合理值。設此 IS 及 LM 線共同構成總需求線，則下列何者不是導致總需求線右移的因素？A)自發性消費增加　B)出口增加　C)自發性進口減少　D)政府支出增加　E)本國所得增加

6. 如果物價意外下跌，下列何者正確？A)有淨負債者受損　B)拿固定薪水者受損　C)持有銀行存款者受損　D)企業股東獲益

7. 下列何者不會使台灣當年 GNP 增加？A)聘用外勞幫忙照顧老人　B)海角七號大受歡迎，電影院加映午夜場　C)舊車商買賣舊車數量增加導致盈餘增加　D)美國戴爾電腦公司委託陽明海運公司運送一批電腦　E)戶政事務所提供臨時工作讓失業的人在戶政事務所幫忙

8. 下列有關台灣貨幣政策，何者有誤？A)央行對銀行放款，列為央行資產　B)財政部買入公債有擴張貨幣的效果　C)台幣發行屬央行負債　D)央行負債包括財政部在央行存款

9. 財政赤字的副作用不包括 A)若以發公債為財源，導致實質利率提高，排擠民間投資 B)若央行發行貨幣買入新發債券，則本國貨幣供給增加，導致通膨 C)若以增稅為財源，導致人民消費減少 D)若以發公債為財源，未來利息支出增加，排擠其他政府支出項目

10. 下列有關台灣央行在外匯市場的操作何者有誤？A)央行若未買賣外匯，則國際收支平衡 B)央行若買入美元，則外匯存底增加 C)銀行每日買賣外匯有供需不平衡之時皆由央行彌補 D)央行買入外匯有擴張國內貨幣的效果

11. 依一般 IS-LM 模型，若貨幣市場經常維持均衡狀態，貨物市場則可能存在不均衡的狀態，當實際所得超過均衡所得，則下列何者錯誤？A)計畫中的支出低於所得 B)實際消費高於均衡所得的消費 C)企業的存貨增加 D)實際利率高於均衡所得的利率

12. 假設稅收皆為定額稅，考慮政府政策對提高所得的效果大小。A)政府支出增加 > 發消費券 = 減稅 B)政府支出增加 > 減稅 > 發消費券 C)發消費券 > 政府支出增加 > 減稅 D) 政府支出增加 > 發消費券 > 減稅

13. 有關凱因斯學派，古典學派，新興古典學派，下列何者錯誤？ A)其中兩者假設物價可以自由變動 B)其中之一認為勞方能確知實際物價水準 C)三者皆認為財政政策優於貨幣政策 D)其中兩者不贊成政府調節經濟

14. 下列何者不是台幣對美元貶值的影響？A)造成台灣物價上漲 B)企業美元負債以台幣計算負擔提高 C)進口商以台幣計算進貨成本提高 D)出口商商品美元報價提高

15. 設有相等金額的政府支出增加、定額稅減少及自發性投資增加，依一般 IS-LM 模型，下列何者錯誤？A)三者皆導致利率提高 B)減稅對所得擴張的效果最低 C)減稅也會對民間投資有排擠效果 D)自發性投資增加導致利率提高及投資減少，故新均衡投資支出可能較原均衡為低

16. 某甲去年薪資所得 100 萬，購台灣生產消費品 40 萬，國外生產消費品 20 萬，又購當年新建房屋一棟 300 萬，依國民所得帳方式分析某甲的支出，下列何者正確？ A)C=60，S=-260，I=300，M=20　B)C=60，S=40，I=300，M=20 C)C=340，S=-240，M=20 D)C=40，I=300，S=60，M=20

17. 設一國只有單一銀行，放款至極限，有如下資料：準備金 400 億，放款 4500 億，存款 4000 億，則 A)法定準備率<10% B)中央銀行發行貨幣 900 億 C)銀行資產負債表中負債總額為 4000 億 D)銀行產生虧損

18. 台灣消費者物價指數 A)依商品批發價 B)不含服務業價格 C)含實體商品及服務業價格 D)包括股票價格 E)包括平均薪資水準

19. 若一國在所得為均衡時，企業投資需求太低，同時有經常帳逆差，依一般 IS-LM-BP 模型，假設匯率浮動，資本移動自由，則此時最恰當政策為 A)政府支出與貨幣供給同時減少 B)政府支出與貨幣供給同時增加 C)增加政府支出同時減少貨幣供給 D)減少政府支出

20. 若某國只生產食物及衣服，其價格及數量如下表：

	食物		衣服	
	價格	數量	價格	數量
2000	10	200	20	300
2001	12	220	22	250

以 2000 年為基期，則 2001 年經濟成長率 g　A)0<g<5% B)5%<g C)-5%<g<0 D)-5%>g

科目：財務管理【財管系碩士班】　✓

<u>Make sure that you have 25 questions. Each question is worth 4 points.</u> 若為選擇題，均是單選題。

1. When investors calculate the return on their financial investment, which method will provide the "realized" rate of return ? (1) arithmetic average (2)geometric average (3) IRR (4) NPV (5) None of above.

2. You are watching the following three stocks:

Stock	Standard Deviation	Beta
A	0.16	0.80
B	0.24	0.62
C	0.21	1.30

   If you are a risk minimizer, you should choose Stock _____ if it is to be held in isolation and Stock _____ if it is to be held as part of a well-diversified portfolio. (1)A; A (2) A; B (3) B; A (4) C; A (5) C; B (6) None of the above.

3. Minimizing the weighted average cost of capital is the same as: (1) Maximizing the market value of the firm. (2) Maximizing the market value of the firm only if MM's Proposition I holds. (3)Maximizing the profits of the firm (4)None of the above

4. In an efficient market: (A) Publicly held companies should diversify their operations because investors benefit from diversification. (B)Publicly held companies should not diversify their operations. (C) Investors' wealth is not affected regardless of whether or not companies diversify their operations. Which of the above are (is) correct ? (1)A, (2)B, (3)C, (4)AC, (5)BC, (6) ABC, (7)None of the above.

5. John takes <u>long positions only</u> in stocks (i.e. no short positions in stocks) in his portfolio. When John increases the number of stocks (in his portfolio) from 10 to 1,000 and does whatever he can, what is <u>the lowest possible value of β</u> of his portfolio (while earning a positive expected return at the same time) ? (1) -1　(2) 0　(3) 1　(4) between 0 and 1 (5) between -1 and 0 (6) None of the above.

6. Is it possible to observe the following: Stock A's standard deviation = 50%. Stock B's standard deviation = 40%. However, $E(r_A) < E(r_B)$. (A) Yes if the market is inefficient. (B)Yes even if the market is efficient (C) No if the market is efficient (D) No if the market is inefficient. (1)A (2)B (3)C (4)D (5)AB (6)AC (7)BD (8)None of the above.

7. If the stock returns follow a random walk, the correlation between stock market index return and TSM stock return = (1) 1　(2) 0.5　(3) between 0 and 1　(4) 0　(5) between 0 and -1

科目：財務管理【財管系碩士班】

8. Which of the following statements is most correct? (1) We would observe a downward shift in the required returns of all stocks if investors believed that there would be deflation in the economy. (2)If investors became more risk averse, then the new security market line would have a steeper slope. (3) If the beta of a company doubles, then the required rate of return will also double. (4)Both statements (1) and (2) are correct. (5) All of the statements (1), (2), and (3) are correct.

9. ABC Company is financed entirely by Common stock which is priced to offer a 20% expected return. If the company repurchases 50% of the stock and substitutes an equal value of debt yielding 8%, what is the expected return on the common stock after refinancing? Assume that the market is perfect. (1) between 0 and 10% (2) between 10.01% and 20% (3) between 20.01% and 30% (4) between 30.01% and 40% (5) greater than 40.01%.

10. Which of the following statements is most correct? (1) Capital components are the types of capital used by firms to raise money. All capital comes from one of three components: long-term debt, preferred stock, and equity. (2) Preferred stock does not involve any adjustment for flotation cost since the dividend and price are fixed. (3) The cost of debt used in calculating the WACC is an average of the after-tax cost of new debt and of outstanding debt. (4) The opportunity cost principle implies that if the firm cannot invest retained earnings and earn at least r_s, it should pay these funds to its stockholders and let them invest directly in other assets that do provide this return. (5) The cost of common stock, r_s, is usually less than the cost of preferred stock.

11. Which of the following statements is most correct? (1) An option's value is determined by its exercise value, which is the market price of the stock less its striking price. Thus, an option can't sell for more than its exercise value. (2) As stock price rises, the premium portion of an option on a stock increases because the difference between the price of the stock and the fixed striking price increases. (3) The market value of an option depends in part on the option's time to maturity and on the variability of the underlying stock's price. (4)Issuing options provides companies with a low cost method of raising capital. (5) The potential loss on an option decreases as the option sells at higher prices because the profit margin gets bigger.

12. The traditionalist view of capital structure is different from Modigliani and Miller's (MM's) views because: (1) MM assume risk-free debt (2)MM ignore the increase in stockholder risk as debt-equity ratio increases (3)The traditionalists ignore the increase in stockholder risk as the debt-equity ratio increases (4)None of the above

科目：財務管理【財管系碩士班】

13. Which of the following represent potential gains from an acquisition?
    I. the replacement of ineffective managers
    II. lower costs per unit produced
    III. an increase in firm size so that diseconomies of scale are realized
    IV. spreading of overhead costs

    A.　II and III only
    B.　I and IV only
    C.　I, II, and IV only
    D.　I, III, and IV only
    E.　I, II, III, and IV

14. Which of the following statements are correct?
    I. Vega measures the sensitivity of an option's value to the passage of time.
    II. Theta measures the sensitivity of an option's value to the passage of time.
    III. Call options tend to be more sensitive to the passage of time than are put options.
    IV. An increase in time increases the value of a call option.

    A.　I and III only
    B.　II and IV only
    C.　II, III, and IV only
    D.　I, III, and IV only
    E.　I, II, III, and IV

15. Which of the following statements are correct?
    I. The usage of forward rates can help reduce the short-run exposure to exchange rate risk.
    II. Accounting translation gains are recorded on the income statement as other income.
    III. The long-run exchange rate risk faced by an international firm can be reduced if the firm borrows money in the foreign country where they have operations.
    IV. Unexpected changes in economic conditions are classified as short-run exposure to exchange rate risk.

    A.　I and III only
    B.　II and IV only
    C.　II and III only
    D.　I and IV only
    E.　I and II only

16. Which of the following statements is correct concerning the effects of granting credit to customers?
    I. Total revenues may increase if both the quantity sold and the price per unit increase when credit is granted.
    II. A firm's cash cycle generally increases if credit is granted, all else equal.
    III. Both the cost of default and the cost of discounts must be considered before granting credit.
    IV. A firm may have to increase its borrowing if it decides to grant credit to its customers.

    A.　I, II, and III only
    B.　II, III, and IV only
    C.　I, III, and IV only
    D.　I, II, and IV only
    E.　I, II, III, and IV

17. Which of the following statements is (are) correct?
    I. A firm has a greater likelihood of needing an unexpected loan when its cash flows are relatively constant over time.

科目：財務管理【財管系碩士班】

II. The cost of borrowing and the cost of selling securities affect the target cash balance of a firm.
III. Management's desire to maintain a low cash balance affects their need to borrow money.
IV. The target cash balance decreases as the interest rate rises.

    A.   II and III only
    B.   II and IV only
    C.   I, II, and IV only
    D.   II, III, and IV only
    E.   I, II, III, and IV

18. Which of the following are valid reasons for a firm to reduce or eliminate its cash dividends?
I. The firm is on the verge of violating a bond restriction which requires a current ratio of 1.8 or higher.
II. A firm has just received a patent on a new product for which there is strong market demand and they need the funds to bring the product to the marketplace.
III. The firm can raise new capital easily at a very low cost.
IV. The tax laws have recently changed such that dividends are taxed at an investor's marginal rate while capital gains are tax exempt.

    A.   I and III only
    B.   II and IV only
    C.   II, III, and IV only
    D.   I, II, and IV only
    E.   I, II, III, and IV

19. The optimal capital structure:

    A.   will be the same for all firms in the same industry.
    B.   will remain constant over time unless the firm does an acquisition.
    C.   of a firm will vary over time as taxes and market conditions change.
    D.   places more emphasis on the operations of a firm rather than the financing of a firm.
    E.   is unaffected by changes in the financial markets.

20. If a firm uses its WACC as the discount rate for all of the projects it undertakes then the firm will tend to:
I. reject some positive net present value projects.
II. accept some negative net present value projects.
III. favor low risk projects over high risk projects.
IV. become riskier over time.

    A.   I and III only
    B.   III and IV only
    C.   I and II only
    D.   I, II, and IV only
    E.   I, II, III, and IV

21. Which of the following statements are correct concerning employee stock options (ESOs)?
I. ESOs grant the employee the right to buy company stock at a fixed price.
II. ESOs generally have a shorter life than call options.
III. Employees may lose their ESOs if they leave their job.
IV. ESOs are sometimes used as a substitute for cash wages.

    A.   I and III only
    B.   II and IV only
    C.   I, III, and IV only

　　D.　　II, III, and IV only
　　E.　　I, II, III, and IV

22. Which of the following statements is correct concerning convertible bonds?
I. New shares of stock are issued when a convertible bond is converted.
II. A convertible bond is similar to a bond with a put option.
III. A convertible bond should never be worth less than its straight bond value.
IV. A convertible bond can be described as having upside potential with downside protection.

　　A.　　I and III only
　　B.　　II and IV only
　　C.　　I, II, and III only
　　D.　　I, III, and IV only
　　E.　　II, III, and IV only

23. If interest rates fall, P, is the price change in a bond with "t" years until maturity. Suppose there are four bonds: B2, B4, B22, B24. If the bonds are identical in every respect except for their maturity, which of the following statements is true?
A. P(B2 - B4)>0
B. P(B2 - B4)=0
C. P(B2 - B4) - P(B22 - B24) > 0
D. P(B2 - B4) - P(B22 - B24)<0
E. P(B2 - B4) - P(B22 - B24)=0

24. The spot rate for the Japanese yen currently is ¥106 per $1. The one-year forward rate is ¥105 per $1. A risk-free asset in Japan is currently earning 5 percent. If interest rate parity holds, approximately what rate can you earn on a one-year risk-free U.S. security? _____ (Please provide final answer, no detail is needed)

25. Firm A is planning on merging with Firm B. Firm A will pay Firm B's stockholders the current value of their stock in shares of Firm A. Firm A currently has 2,300 shares of stock outstanding at a market price of $20 a share. Firm B has 1,800 shares outstanding at a price of $15 a share. What is the value per share of the merged firm? _____ (Please provide final answer, no detail is needed)

I. 選擇題 (題目答案可能是單選或多選，共 60 分，每題 4 分)

1. Statistical inference
   - (A). refers to the process of drawing inferences about the sample based on the characteristics of the population.
   - (B). is the same as descriptive statistics.
   - (C). is the process of drawing inferences about the population based on the information taken from the sample.
   - (D). is the same as a census.

2. Given P(A)=0.40, P(B)=0.60, P(A∩B)=0.24. Which of the following is true?
   - (A). A and B are independent.
   - (B). A and B are not mutually exclusive.
   - (C). A and B are collectively exhaustive.
   - (D). None of the above.

3. Which of the following are characteristics of the normal probability distribution?
   - (A). The mean, median, and mode are equal.
   - (B). The mean of the distribution can be negative, zero, or positive.
   - (C). The distribution is symmetrical.
   - (D). The standard deviation must be 1.

4. Which of the following statements are correct regarding the t-distribution?
   - (A). t distribution approaches the standard normal curves as sample sizes become large.
   - (B). t test is quite robust.
   - (C). t test is also referred to as the Student's t test.
   - (D). All of above are correct.

5. Which of the following statements about properties of point estimators are correct?
   - (A). If the expected value of the sample statistic is equal to the population parameter being estimated, the sample statistic is said to be an unbiased estimator of the population parameter.
   - (B). The point estimator with the larger standard error is said to have less relative efficiency than the other.
   - (C). A point estimator is said to be consistent if the values of the point estimator tend to become closer to the population parameter as the sample size becomes larger.
   - (D). All of above are correct.

6. Which of the following statements for Poisson distribution are correct?
   - (A). The mean and variance of Poisson distribution are equal.
   - (B). The expected number of occurrences is not necessary to hold constant throughout the experiment
   - (C). As a rule of thumb, if n>20 and np≦7, the approximation is close enough to use the Poisson distribution for binominal problems.
   - (D). Each occurrence is independent of the other occurrences.

科目：統計學【財管系碩士班】

7. Which of the following statements for Exponential distribution are not correct?
   (A). it is a family of distribution.
   (B). it is a continuous distribution.
   (C). it describes random occurrences over some interval.
   (D). it is skewed to the left.

8. The key difference between the binomial and hypergeometric distribution is that with the hypergeometric distribution
   (A). the probability of success must be less than 0.5.
   (B). the trials are independent of each other.
   (C). the probability of success changes from trial to trial.
   (D). The population is finite and known.

9. Chebyshev's Theorem is important because
   (A). it explains an unusual mathematical phenomenon.
   (B). it enables us to give meaning to a sample standard deviation.
   (C). it gives the fraction of the measurements in a sample that fall within k standard deviation's of the sample mean.
   (D). it explains why the sample mean is a good measure of central tendency.

10. 下列何種敘述不屬於非抽樣誤差
    (A). 拒絕回答的誤差。
    (B). 報告的誤差。
    (C). 測度的誤差。
    (D). 以點估計量估計母數的誤差。

11. Stratified sampling is generally more efficient than simple random sampling if:
    (A). only a few strata are used in the stratification.
    (B). each strata contains about the same variability as the entire population with respect to the characteristic of interest.
    (C). non-sampling errors are of no consequence or expected to be slight.
    (D). the item within each strata are relatively homogeneous.

12. 台灣高鐵公司宣稱其台北至高雄列車的平均誤點不超過八分鐘，消基會懷疑高鐵公司宣稱的真實性，因此決定調查其平均誤點時間，以作為統計檢定之用，請問以下陳述何者正確。
    (A). 型二誤差為列車誤點時間不超過八分鐘，但消基會認為列車誤點時間超過八分鐘。
    (B). 若雙方均同意以十二分鐘作為檢驗標準點，則增加調查班次數對雙方均有利。
    (C). 若檢定出來之 P 值很大，則對高鐵公司較有利。
    (D). 以上皆非。

13. 下列陳述何者正確
    (A). 母體變異數未知，但已知母體為常態分配時，若用 Z 分配與 t 分配對母體平均數計算信賴區間，則兩者信賴區間長度一樣。
    (B). 母體為常態分配，且母體變異數為已知時，若信賴水準不變，則母體平均數的信賴區間長度會隨樣本數的增加而變小。
    (C). 信賴區間的長度會隨信賴水準的增加而變大。
    (D). 以上皆非。

14. Which of the following statements for nonparametric statistics are not correct?
   (A). Nonparametric testes are usually not as widely available and well known as parametric tests.
   (B). Nonparametric statistics are based in more assumptions about the population than parametric statistics.
   (C). For small sample, the calculations for many nonparametric statistics can be tedious.
   (D). Probability statements obtained from most nonparametric tests are exact probabilities.

15. When the smallest and the largest percentage of items are removed from a data set and the mean is computed, the mean of the remaining data is:
   (A). the median.
   (B). the mode.
   (C). greater than the mean of the original data.
   (D). less than the mean of the original data.
   (E). none of the above are correct.

II. 問答題 (共 40 分)

1. A consumer test group wants to determine the difference in gasoline mileage of two new developed hybrid car A and B. Researchers took 50 cars for the car A and also 50 cars for the car B, and tested each car on one tank of gas. The sample average for the car A was 21.45 kilometer per litter (KM/L), with a standard deviation of 3.46 KM/L. The sample average for the car B was 24.6 KM/L, with a standard deviation of 2.99 KM/L. Assume all samples are normal distribution. Construct a 95% confidence interval to estimate the difference in the mean gas mileage between the car A and car B. (4 分)

2. The manager of a book store wants to determine what proportion of people who enter the store use credit cards for their purchases. What size sample should he take so that at 98% confidence the error will not be more than 4%? (4 分)

3. A soft drink company states the following hypotheses about the mean weight of its drink per can.
   H_0 : $\mu = 28$ ounces
   H_a : $\mu \neq 28$ ounces
   If a manager conducting the test will permit a 0.15 probability of making a Type II error when the true mean is 29 ounces, what sample size should be selected? Assume $\sigma = 6$ and $\alpha = 0.05$. (4 分)

4. A book dealer received a lot of 1,500 books from a printer. The dealer plans to sample 12 books and use single-sample acceptance sampling to reach a decision about the lot. If more than one book is defective, the dealer will reject the lot. Suppose the printer is fairly certain that only 3% of the books are defective. What is the producer's risk? Suppose 12% of the lot of books is defective and that this rate would be too high for the dealer to accept. What is the dealer's risk in using this acceptance sampling? (4 分)

科目：統計學【財管系碩士班】

5. A telephone survey conducted by a Research Company found that 43% of Taiwanese expect to save more money next year than they saved last year because of the financial crisis. 45% of those surveyed plan to reduce debt next year. Of those who expect to save more money next year, 81% plan to reduce debt next year. A Taiwanese is selected randomly. What is the probability that this person neither expect to save more money next year nor plans to reduce debt next year? (4 分)

6. 一個塑身中心在比較三種減肥方法減重的成效，受測者的年齡分為五個年齡層。為了測試不同減肥方法減重的成效，以及不同年齡層的減肥成效是否有差異，該研究中心進行測試，得到的數據如下：

年齡層	減肥方法(一個月減少公斤數)		
	方法一	方法二	方法三
A(15-25)	3.1	4.0	3.1
B(26-35)	3.4	3.9	2.9
C(36-45)	3.2	4.1	3.0
D(46-55)	3.0	4.0	2.7
E(56-65)	2.8	4.3	3.0

若以 ANOVA 進行以上數據的分析，可得到下表

變源	SS	自由度	MS	F	P 值
列	0.0733		0.0183		0.756
欄			1.8347		0.000
錯誤	0.3107				
總和	4.0533				

(A). 請完成上面的 ANOVA 表(5 分)

(B). 若以 α=0.05 檢定：可以得到什麼結論？如果忽略了 Blocking Variable（年齡層），ANOVA Table 會變成什麼樣子？ANOVA 的結果會產生什麼樣的變化？為什麼？(5 分)

7. The general manager of a major league baseball team believes the ages of purchases of game tickets are normally distributed. The following data represent the distribution of ages for a sample of observed purchases of major league baseball game tickets. Use the chi-square goodness-of-fit test to determine whether this distribution is significantly different from the normal distribution. Assume that α=0.05 (10 分)

Age of Purchaser	Frequency
10-under 20	16
20-under 30	44
30-under 40	61
40-under 50	56
50-under 60	35
60-under 70	19
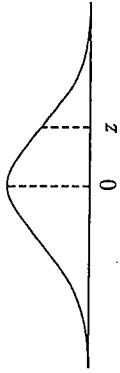
Normal Z-Distribution

| z	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
0.0	0.0000	0.0040	0.0080	0.0120	0.0160	0.0199	0.0239	0.0279	0.0319	0.0359
0.1	0.0398	0.0438	0.0478	0.0517	0.0557	0.0596	0.0636	0.0675	0.0714	0.0753
0.2	0.0793	0.0832	0.0871	0.0910	0.0948	0.0987	0.1026	0.1064	0.1103	0.1141
0.3	0.1179	0.1217	0.1255	0.1293	0.1331	0.1368	0.1406	0.1443	0.1480	0.1517
0.4	0.1554	0.1591	0.1628	0.1664	0.1700	0.1736	0.1772	0.1808	0.1844	0.1879
0.5	0.1915	0.1950	0.1985	0.2019	0.2054	0.2088	0.2123	0.2157	0.2190	0.2224
0.6	0.2257	0.2291	0.2324	0.2357	0.2389	0.2422	0.2454	0.2486	0.2517	0.2549
0.7	0.2580	0.2611	0.2642	0.2673	0.2704	0.2734	0.2764	0.2794	0.2823	0.2852
0.8	0.2881	0.2910	0.2939	0.2967	0.2995	0.3023	0.3051	0.3078	0.3106	0.3133
0.9	0.3159	0.3186	0.3212	0.3238	0.3264	0.3289	0.3315	0.3340	0.3365	0.3389
1.0	0.3413	0.3438	0.3461	0.3485	0.3508	0.3531	0.3544	0.3577	0.3599	0.3621
1.1	0.3643	0.3665	0.3686	0.3708	0.3729	0.3749	0.3770	0.3790	0.3810	0.3830
1.2	0.3849	0.3869	0.3888	0.3907	0.3925	0.3944	0.3962	0.3980	0.3997	0.4015
1.3	0.4032	0.4049	0.4066	0.4082	0.4099	0.4115	0.4131	0.4147	0.4162	0.4177
1.4	0.4192	0.4207	0.4222	0.4236	0.4251	0.4265	0.4279	0.4292	0.4306	0.4319
1.5	0.4332	0.4345	0.4357	0.4370	0.4382	0.4394	0.4406	0.4418	0.4429	0.4441
1.6	0.4452	0.4463	0.4474	0.4484	0.4495	0.4505	0.4515	0.4525	0.4535	0.4545
1.7	0.4554	0.4564	0.4573	0.4582	0.4591	0.4599	0.4608	0.4616	0.4625	0.4633
1.8	0.4641	0.4649	0.4656	0.4664	0.4671	0.4678	0.4686	0.4693	0.4699	0.4706
1.9	0.4713	0.4719	0.4726	0.4732	0.4738	0.4744	0.4750	0.4756	0.4761	0.4767
2.0	0.4772	0.4778	0.4786	0.4788	0.4793	0.4798	0.4803	0.4808	0.4812	0.4817
2.1	0.4821	0.4826	0.4830	0.4834	0.4838	0.4842	0.4846	0.4850	0.4854	0.4857
2.2	0.4831	0.4864	0.4868	0.4871	0.4875	0.4878	0.4881	0.4884	0.4887	0.4890
2.3	0.4893	0.4896	0.4898	0.4901	0.4904	0.4906	0.4909	0.4911	0.4913	0.4916
2.4	0.4918	0.4920	0.4922	0.4925	0.4927	0.4929	0.4931	0.4932	0.4934	0.4936
2.5	0.4938	0.4940	0.4941	0.4943	0.4945	0.4946	0.4948	0.4949	0.4951	0.4952
2.6	0.4953	0.4955	0.4956	0.4957	0.4959	0.4960	0.4961	0.4962	0.4963	0.4964
2.7	0.4965	0.4966	0.4967	0.4968	0.4969	0.4970	0.4971	0.4972	0.4973	0.4974
2.8	0.4974	0.4975	0.4976	0.4977	0.4977	0.4978	0.4979	0.4979	0.4980	0.4981
2.9	0.4981	0.4982	0.4982	0.4983	0.4984	0.4984	0.4985	0.4985	0.4986	0.4986
3.0	0.4987	0.4987	0.4987	0.4988	0.4988	0.4989	0.4989	0.4989	0.4990	0.4990.
3.1	0.4990	0.4991	0.4991	0.4991	0.4992	0.4992	0.4992	0.4992	0.4993	0.4993
3.2	0.4993	0.4993	0.4994	0.4994	0.4994	0.4994	0.4994	0.4995	0.4995	0.4995
3.3	0.4995	0.4995	0.4995	0.4996	0.4996	0.4996	0.4996	0.4996	0.4996	0.4997
3.4	0.4997	0.4997	0.4997	0.4997	0.4997	0.4997	0.4997	0.4997	0.4997	0.4998
3.5	0.4998	0.4998	0.4998	0.4998	0.4998	0.4998	0.4998	0.4998	0.4998	0.4998
3.6	0.4998	0.4998	0.4999	0.4999	0.4999	0.4999	0.4999	0.4999	0.4999	0.4999
3.7	0.4999	0.4999	0.4999	0.4999	0.4999	0.4999	0.4999	0.4999	0.4999	0.4999
3.8	0.4999	0.4999	0.4999	0.4999	0.4999	0.4999	0.4999	0.4999	0.4999	0.4999
3.9	0.5000	0.5000	0.5000	0.5000	0.5000	0.5000	0.5000	0.5000	0.5000	0.5000
4.0	0.5000	0.5000	0.5000	0.5000	0.5000	0.5000	0.5000	0.5000	0.5000	0.5000
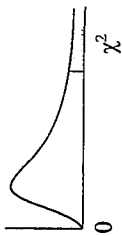
卡方分配底下之右尾面積

自由度	.995	.990	.975	.950	.900	.100	.050	.025	.010	.005
1	0.000	0.000	0.001	0.004	0.016	2.706	3.841	5.024	6.635	7.878
2	0.010	0.020	0.051	0.103	0.211	4.605	5.991	7.378	9.210	10.597
3	0.072	0.115	0.216	0.352	0.584	6.251	7.815	9.348	11.345	12.838
4	0.207	0.297	0.484	0.711	1.064	7.779	9.488	11.143	13.277	14.860
5	0.412	0.554	0.831	1.145	1.610	9.236	11.070	12.833	15.086	16.750
6	0.676	0.872	1.237	1.635	2.204	10.645	12.592	14.449	16.812	18.548
7	0.989	1.239	1.690	2.167	2.833	12.017	14.067	16.013	18.475	20.278
8	1.344	1.646	2.180	2.733	3.490	13.362	15.507	17.535	20.090	21.955
9	1.735	2.088	2.700	3.325	4.168	14.684	16.919	19.023	21.666	23.589
10	2.156	2.558	3.247	3.940	4.865	15.987	18.307	20.483	23.209	25.188
11	2.603	3.053	3.816	4.575	5.578	17.275	19.675	21.920	24.725	26.757
12	3.074	3.571	4.404	5.226	6.304	18.549	21.026	23.337	26.217	28.300
13	3.565	4.107	5.009	5.892	7.042	19.812	22.362	24.736	27.688	29.819
14	4.075	4.660	5.629	6.571	7.790	21.064	23.685	26.119	29.141	31.319
15	4.601	5.229	6.262	7.261	8.547	22.307	24.996	27.488	30.578	32.801
16	5.142	5.812	6.908	7.962	9.312	23.542	26.296	28.845	32.000	34.267
17	5.697	6.408	7.564	8.672	10.088	24.769	27.587	30.191	33.409	35.718
18	6.265	7.018	8.231	9.390	10.865	25.989	28.869	31.526	34.805	37.156
19	6.844	7.633	8.907	10.117	11.651	27.204	30.144	32.852	36.191	38.587
20	7.434	8.260	9.591	10.851	12.443	28.412	31.410	34.170	37.566	39.997
21	8.034	8.897	10.283	11.591	13.240	29.615	32.671	35.479	38.932	41.401
22	8.643	9.542	10.982	12.338	14.041	30.813	33.924	36.781	40.289	42.796
23	9.260	10.196	11.689	13.091	14.848	32.007	35.172	38.076	41.638	44.181
24	9.886	10.856	12.401	13.848	15.659	33.196	36.415	39.364	42.980	45.559
25	10.520	11.524	13.120	14.611	16.473	34.382	37.652	40.646	44.314	46.928
26	11.160	12.198	13.844	15.379	17.292	35.563	38.885	41.923	45.642	48.290
27	11.808	12.879	14.573	16.151	18.114	36.741	40.113	43.195	46.963	49.645
28	12.461	13.565	15.308	16.928	18.939	37.916	41.337	44.461	48.278	50.993
29	13.121	14.256	16.047	17.708	19.768	39.087	42.557	45.722	49.588	52.330
30	13.787	14.953	16.791	18.493	20.599	40.256	43.773	46.979	50.892	53.672
40	20.707	22.164	24.433	26.509	29.051	51.805	55.58	59.342	63.691	66.766
50	27.991	29.707	32.357	34.764	37.689	63.167	67.505	71.420	76.154	79.490
60	35.534	37.485	40.482	43.188	46.459	74.397	79.082	83.298	88.379	91.952
70	43.275	45.442	48.758	51.739	55.329	85.527	90.531	95.023	100.425	104.215
80	51.172	53.540	57.153	60.391	64.278	96.578	101.879	106.629	112.329	116.321
90	59.196	61.754	65.647	69.126	73.291	107.565	113.145	118.136	124.116	128.299
100	67.328	70.065	74.222	77.929	82.358	118.498	124.342	129.561	135.807	140.169