

(1) In order to plan how much cash to keep on hand in the vault, a bank is interested in seeing if the average deposit of a customer is normally distributed. A newly hired employee hoping for a raise has collected the following information:

(25%)

Deposit	\$0-\$999	\$1,000-\$1,999	\$2,000 and more
Observed frequency	20	65	25

- (a) Compute the expected frequencies if the data are normally distributed with mean \$1,500 and standard deviation \$600.
 (b) Compute the chi-square statistic.
 (c) State explicit null and alternative hypotheses.
 (d) Test your hypotheses at the 0.10 level, and state an explicit conclusion.

(2) Given: The probabilities of three events, A, B, and C, occurring are $P(A)=0.35$, $P(B)=0.45$, and $P(C)=0.2$. Assuming that A, B, or C has occurred, the probabilities of another event, X, occurring are $P(X|A)=0.8$, $P(X|B)=0.65$, and $P(X|C)=0.3$. Find $P(A|X)$; $P(B|X)$; and $P(C|X)$.

(25%)

(3) The variability of fills in a bottling plant is almost as important as the average, because a large variance would result in some bottles being quite underfilled and in others being overfilled. In a test of two automatic bottle-filling machines, random samples from the two machines were drawn; 25 observations (measured in ounces) from machine 1 had a variance of $S_1^2 = 1.63$, and 15 observations from machine 2 produced $S_2^2 = 1.23$. Estimate with 90% confidence the ratio of the two population variances.

(25%)

(4) Suppose we want to test a null hypothesis that the mean of a population is 145 against an alternative hypothesis that the mean is less than 145. A sample of 100 measurements drawn from the population (whose standard deviation is 20) yields a mean of 140. If the probability of a Type I error is chosen to be 0.05, calculate the probability of a Type II error, assuming that the true population mean equals 142.

(25%)

1. (15%) Let X and Y be discrete random variables with joint probability function

$$f(x, y) = \frac{x^2 + y^2}{56} \quad \text{for } x = 1, 2, 3 \quad \text{and } y = 1, \dots, x.$$

what is $P(Y = 3 | Y \geq 2)$?

2. (10%) Let $X_1, X_2,$ and X_3 be a random sample from a discrete distribution with probability function

$$g(x) = \begin{cases} x/10 & \text{for } x = 1, 2, 3, 4 \\ 0, & \text{otherwise.} \end{cases}$$

What is $P(X_1 < X_2 < X_3)$?

3. (25%) The mean birth weight of the United States is $\mu = 3500$ grams with a standard deviation of $\sigma = 600$. Let X equal the birth weight in grams in Taiwan. Assume that the distribution of X is $N(\mu, \sigma^2)$. We shall test the null hypothesis $H_0 : \mu = 3500$ versus $H_1 : \mu < 3500$ using a random sample of $n = 30$.

(a) Define a critical region that has a significance level of $\alpha = 0.05$.

(b) $n = 30, \bar{x}_{30} = 3375,$ and $s = 525,$ what is your conclusion?

(c) Find a 95% confidence interval of μ if $n = 30, \bar{x}_{30} = 3375$ but assume $\sigma = 600$.

4. (10%) Let X_1, X_2, \dots, X_n be a random sample from a distribution having finite variance σ^2 . Show that

$$S^2 = \sum_{i=1}^n \frac{(X_i - \bar{X})^2}{n-1}$$

is an unbiased estimator of σ^2 , where $\bar{X} = \sum_{i=1}^n X_i/n$.

5. (15%) A random sample X_1, X_2, \dots, X_n of size n is taken from a Poisson distribution with a mean of $\lambda, 0 < \lambda < \infty$.

(a) Show that the maximum likelihood estimator for λ is $\hat{\lambda} = \bar{X}_n$.

(b) If 40 observations of yielded 5 zeros, 7 ones, 12 twos, 9 threes, 5 fours, 1 five, and 1 six, find the maximum likelihood estimate of λ .

6. (15%) Let Y be $B(200, p)$. We reject $H_0 : p = 0.5$ and accept $H_1 : p > 0.5$ if and only if $Y \geq 112$. Use the normal approximation to determine

(a) the Type-I error $\alpha = P(Y \geq 112; p = 0.5)$.

(b) the Type-II error $\beta = P(Y < 112)$ when $p = 0.6$.

7. (10%) Define the meaning of a *Sufficient Statistic* and find the sufficient statistic for θ if X_1, X_2, \dots, X_n is a random sample from a distribution with p.d.f.

$$f(x | \theta) = \theta x^{\theta-1}, \quad 0 < x < 1, \quad \text{where } \theta > 0.$$

科目	會計學	所別	保險研究所	考試時間	月 日 上午第 節
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- 一、惠勝公司係一股票上市公司。81年3月，惠勝公司向台灣證券交易所申請股票上市，5月22日通過台灣證券交易所的審議之後，其股票隨即掛牌公開買賣。
- 惠勝之產品多以黃豆為原料，黃豆為向國外進口之大宗物資，數量龐大。進口黃豆，冒外匯漲跌之風險。惠勝各年之損益表不是列報相當金額之外匯損失，就是出現相當金額之外匯盈餘。
- 84年3月10日經濟日報登載：「近期有人檢舉，惠勝以與關係企業進行非常規交易（之）方式，做假帳，虛列盈餘，以符合股票上市標準」。高雄地檢處台南調查站約談惠勝公司有關人員時，有人供稱「惠勝上市前實際並未獲利，但為達上市標準，營業利益須達資本額的10%以上。（惠勝）遂以做假帳的方式，一個月的營業利益超列數千萬元，使得公開說明書上的稅前盈餘達到7,500萬元，才順利獲得上市」。
- 因此，調查站偵查方向之一為惠勝的關係企業和往來的客戶廠商。由此可見，關係人交易是一個被懷疑的對象。

試問：（20%）

- 1、在上述案例中，關係人交易為何是一個被懷疑的對象？
- 2、我國財務會計準則公報第六號「關係人交易之揭露」是否禁止企業進行關係人交易？如果是的話，該公報如何設計以達到禁止之目的？如果否的話，該公報既不禁止關係人交易，那麼，訂立公報的目的何在？（請勿逐條列示公報之詳細規定，只須說明公報的精神）

- 二、提供會計資訊之目的，在幫助決策人作成決策。財務報表使用人評估會計資訊的品質時，常評估其可靠性（reliability）及攸關性（relevance）。
- 現行商業會計法第六十六條規定：「商業負責人、主辦及經辦會計人員有下列各款情事之一者，處五年以下有期徒刑、拘役或一萬元以下罰金：
- 一、以明知為不實之事項而填製會計憑證或記入帳冊者。
 - 二、故意使應保存之會計憑證、帳簿報表滅失、毀損者。
 - 三、意圖不法之利益，而變造會計憑證、帳簿報表內容或撕毀其頁數者。」；
- 商業會計法修正草案（一讀通過）第七十一條規定：
- 「商業負責人、主辦及經辦會計人員或依法受託代他人處理會計事務之人員有下列情事之一者，處五年以下有期徒刑、拘役或科或併科新台幣十五萬元以下罰金：
- 一、以明知為不實之事項，而填製會計憑證或記入帳冊者。
 - 二、故意使應保存之會計憑證、帳簿報表滅失、毀損者。
 - 三、意圖不法之利益而偽造、變造會計憑證、帳簿報表內容或撕毀其頁數者。
 - 四、故意遺漏會計事項不為記錄，致使財務報表發生不實之結果者。
 - 五、其他利用不正當方法，致使會計事項或財務報表發生不實之結果者。」。

試問：（20%）

- 1、請說明會計資訊的可靠性與攸關性有何不同？
- 2、現行商業會計法第六十六條規定之目的何在？（回答時請著眼於會計資訊的可靠性、攸關性，或二者）
- 3、商業會計法修正草案第七十一條規定之目的何在？（回答時之考量與第二小題相同）

試科目	會計學	所別	保險研究所	考試時間	星期	月	日	上午第	第
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三、指南公司民國82年4月1日晨發生火災，其存貨及大部份會計資料均遭焚毀。該公司會計主任經由各方面獲得下列有關資料：

- (1) 82年1月1日存貨為\$70,000。
- (2) 前三年銷貨與銷貨成本數字如下：

	79年	80年	81年
銷 貨	\$2,280,000	\$2,760,000	\$2,520,000
銷貨成本	\$1,587,000	\$1,941,000	\$1,764,000

(3) 該公司90% 的商品均由甲、乙、丙三家公司供應。根據供應商之計錄，該公司82年1月1日至3月31日購貨情形如下：

供應商	購 貨
甲	\$70,000
乙	40,000
丙	\$34,000

(4) 該公司銷貨中，20% 為現銷，其餘為除銷。81年12月31日及82年3月31日應收帳款總額分別為\$56,000及\$62,000，82年1月至3月應收帳款收現之金額，分別為\$72,000，\$80,000，及\$30,000。

試問：(20%)

試根據上述資料，用毛利法估計被毀商品之成本金額，並請陳述您在計算時所使用的假設。

四、中興紡織公司於民國74年1月4日購置織布機八部，購價每台\$2,400,000，安裝費每台\$800,000，估計可使用10年，殘值每台\$400,000，採用直線法折舊。77年7月1日該公司將機器大修，八台共付現金\$4,480,000。大修後，此一批機器的效能並未提高至機器~~標準~~全新時之原有水準，唯可再使用8年，每台殘值\$200,000。81年初，重新估計這批的耐用年限，認為他們僅可再用三年，每台殘值\$245,000。83年9月1日該公司用該批機器換入另一類型之織布機。此一新型之機器性能較佳，訂價為每台\$2,815,000。舊機器每台作價\$400,000，故須付現金每台\$2,415,000。新機器估計可用8年，殘值每台\$300,000。

試問：(20%)

試根據上述資料作成下列各日期應作之分錄：

- (1) 74年1月4日
- (2) 77年7月1日
- (3) 81年12月31日
- (4) 83年9月1日
- (5) 83年12月31日。

五、Multiple choices, please choose the best answer. (20%) (請儘量作答，答錯不倒扣)

1. On May 1, 1994, Lee began operating a sevice proprietorship with an initial cash investment of \$1,000. The proprietorship provided \$3,200 of services in May and received full payment in June. The proprietorship incurred expenses

of \$1,500 in May which were paid in July. During June, Lee drew \$500 against her capital account.

What was the proprietorship's income for the two months ended June 30, 1994, under the following methods of accounting?

	<u>Cash-basis</u>	<u>Accrual-basis</u>
A、	\$1,200	\$1,200
B、	\$3,200	\$1,700
C、	\$2,700	\$1,200
D、	\$1,700	\$1,700
E、	\$4,200	\$1,200
F、	\$3,700	\$1,700

2、Cobb Co. purchased 10,000 shares (2% of entire ownership, par \$10) of Roe Co. on February 12, 1993. Cobb received a stock dividend of 2,000 shares on March 31, 1994, when the carrying amount per share of Roe was \$40. Roe paid a cash dividend of \$1.50 per share on September 15, 1994. In Cobb's income statement for the year ended October 31, 1994, what amount should Cobb report as dividend income?

- A、\$15,000
- B、\$35,000
- C、\$85,000
- D、\$95,000
- E、\$18,000
- F、\$88,000

3、Based on a physical inventory taken on December 31, 1994, Chewy Co. determined its chocolate inventory on a FIFO basis at \$27,000 with a replacement cost of \$20,000. Chewy estimated that, after further processing costs of \$12,000, the chocolate could be sold as finished candy bars for \$40,000. Chewy's normal profit margin is 10% of sales. Under the lower of cost or market rule, what amount should Chewy report as chocolate inventory in its December 31, 1994, balance sheet?

- A、\$28,000
- B、\$26,000
- C、\$24,000
- D、\$20,000
- E、\$27,000
- F、none of above

4、On November 1, 1994, Wang Co. discounted with recourse at 10% a one-year, noninterest bearing, \$41,000 note receivable maturing on January 31, 1995. What amount of contingent liability for this note must Wang disclose in its financial statements for the year ended December 31, 1994?

- A - \$0
- B - \$40,000
- C - \$40,687
- D - \$41,000
- E - \$41,000 or 0
- F - none of above

5. Lin, Inc. is preparing its financial statements for the year ended December 31, 1994. Accounts payable is amounted to \$360,000 before any necessary year-end adjustment related to the following:

• At December 31, 1994, Lin has a \$50,000 debit balance in its accounts payable to Huang, a supplier, resulting from a \$50,000 advance payment for goods to be manufactured to Lin's specification.

• Checks in the amount of \$100,000 were written to vendors and recorded on December 29, 1994. The checks were mailed on January 5, 1995.

What amount should Lin report as accounts payable in its December 31, 1994, balance sheet?

- A - \$510,000
- B - \$410,000
- C - \$310,000
- D - \$210,000
- E - \$560,000
- F - \$460,000

一、基本概念測試：(四一分)

- (一) 以他人之所有物為標的成立之債權契約，其效力如何？
- (二) 以他人之所有物為標的成立之物權契約，其效力如何？
- (三) 表見代理，本質是否為無權代理？理由何在？
- (四) 無因管理，本質是否為侵權行為？理由何在？

- 二、某甲將土地出租給某乙作為種植果樹之用。某乙種植果樹，果樹上之果實，是否為從物？其所有權歸屬何人？

(二十分)

- 三、某甲向其乙要約出賣其所有之房屋一戶。要約發出後到達某乙之前，某甲死亡。某乙不知某甲死亡之事實，仍於要約所定之期間內，依要約之內容向某甲發信表示承諾。承諾信件到達某甲之繼承人某丙前，該房屋因可歸責於某丙之事由而全部燒毀。試問：(二十分)

- (一) 某甲向其乙之要約，是否發生要約之效力？
- (二) 某乙向某甲之承諾，是否發生承諾之效力？
- (三) 當事人間之買賣契約，是否成立？是否有效？
- (四) 某丙有無損害賠償之責任？

- 四、違反契約之損害賠償請求權與侵權行為之損害賠償請求權發生競合時，以主張何者為有利？(二十分)

科目	保險學	所別	保險研究所	考試時間	月	日	上下
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1. 台灣保險公司即將被允許經營商業年金(Commercial Annuity)產品，請就年金產品的基本特性及台灣資本市場的結構，說明其對保險公司在財務風險管理上與傳統壽險產品間的差異。此外請就你對台灣壽險公司資產管理能力的瞭解及台灣資本市場投資工具的完整性，說明保險公司現階段從事立即年金(Immediate Annuity)和遞延年金(Deferred Annuity)的經營在對公司未來財務結構可能的影響有何差異。(25%)
2. 請說明純保費 (Net Premium) 與法定純保費 (Valuation Net Premium)之間的差異。(10%)
3. 台灣現有許多美商壽險公司多以分公司(Branch)方式在台經營壽險業務，請說明以分公司形態或子公司(Subsidiary)形態在台灣經營壽險業務的優缺點為何？並從財務會計的觀點說明在台美商欲從分公司轉為子公司的可行性。(15%)
4. 請你就保險基本理論，說明第三人強制汽車保險為一社會保險抑或責任保險？此外就費率的計算你認為所謂的無虧無盈應如何定義？(10%)
5. 請具體說明台灣現行保險會計制度及財務監理制度的主要缺點為何？(15%)
6. The law of Large Numbers:
Let random variable Y equal to the number of success in N repetitions of an experiment with probability of success equal to p . (I.e., the probability distribution of Y is the binomial).
 - a. Please show the mathematical form of The Law of Large Numbers. (5%)
 - b. If N equal to 1000,000, and p equal to 0.05, please calculate the risk(absolute risk) that can't be diversified by the law of large numerrel.(5%)
 - c. What is the relationship between the absolute risk, insurer's own capital(buffer fund) and insolvent risk ?(5%)
7. The Insurance Capital Asset Pricing Model:
Let the insurance company's income(Y) is equal to assets investment income(I) plus the underwriting profit(π_U). Define s is the premium-to-surplus ratio, and k is the liability-to-premium ratio. Let's assume that the rate of return of asset is equal to 7%, s is equal to 3.5, and k is equal to 2. And we also know that the risk-free insurer is equal to 4%(assuming no insolvent risk), market risk premium is equal to 5%, and the β_U (Insurance company's underwriting beta) is equal to 1.3. Please calculate the insurance compay's return on equity(ROE) and the underwriting rate of return(r_U). For determining the cost(discount rate) of insurance product, which one is the better bechmark?(10%)

一、我國保險法第一條對「保險」所下之定義為何？此項定義我是否妥當，試討論之。

二、何謂保險利益？要保人或被保險人非同一人時，何人應有保險利益？何時應有保險利益？無保險利益之法律效果為何？我國法關於保險利益之規定是否妥善？試討論之。

三、何謂複保險？其法律效果如何？複保險是否適用於所有的人身保險？我國法關於複保險之規定是否妥善？試討論之。

四、何謂基本條款之特約條款？其法律效力為何？比較英美法，我國法關於此等條款之規定是否妥善？試討論之。

20% 1. Find the following limits:

(i) $\lim_{n \rightarrow \infty} \frac{n^5}{2^n} = ?$

(ii) $\lim_{n \rightarrow \infty} \{ 2^{\frac{1}{n}} + 3^{\frac{1}{n}} \}^n = ?$

10% 2. Let $S(x) = x^2 + x^2(1-x^2) + x^2(1-x^2)^2 + \dots + x^2(1-x^2)^n + \dots$ when $0 < |x| < 1$; and $S(0) = 0$. Is $S(x)$ continuous at $x = 0$?

10% 3. Let P and Q be any two points on the parabolas $y^2 = 4x$, $y^2 = 2x - 6$. Find the minimum distance between P and Q.

10% 4. (i) Find the Taylor expansion of $f(x) = \log_e(1+x)$, $-1 < x < 1$. (ii) Find the approximate value of $\log_e(1.01)$ with the error < 0.00001 .

10% 5. Find the following limit

$\lim_{n \rightarrow \infty} \int_0^x \frac{t^{4n}}{1+t^n} dt = ?$ where $|x| < 1$, $n \in \mathbb{N}$.

10% 6. Using the known fact $\int_0^{\infty} \frac{\sin bx}{x} dx = \frac{\pi}{2}$ if $b > 0$, find $\int_0^{\infty} \frac{\sin^2 x}{x^2} dx = ?$.

10% 7. Find $\int_0^1 \sin m\pi x \sin n\pi x dx = ?$ where m and n are integers.

10% 8. If

$f(x, y) = \frac{xy(x^2 - y^2)}{(x^2 + y^2)^2}$, when $(x, y) \neq (0, 0)$,
 $= 0$, when $(x, y) = (0, 0)$.

find the second order partial derivatives $f_{xy}(0, 0)$ and $f_{yx}(0, 0)$.

10% 9. Find the volume of the solid whose base is the rectangle $R = \{ (x, y) \mid 0 < x < 1, 0 \leq y \leq 1 \}$ and whose height at (x, y) is given by $f(x, y) = x + y$.