科目 Course	微積分	開課系級 Dept, & Class	保險所	日期 Date, Period	月 日 第 節	試題編號 Course No.	

30% (1) (a) $\int e^{2\log x}dx = ?$

(b) $\int \frac{(1-x)^2}{x^2}dx = ?$

20% (2) Find every local maximum or minimum for the following functions:

國立政治大學圖書館

(a) $3x^4 - 8x^3 - 18x^2 + 12$

(b) $\sqrt{x-1}$

30% (3) Let $E(x) = \int xf(x)dx$, for $f(x) = \frac{1}{\mu}e^{\frac{-x}{\mu}}$, $\mu \geq 0$, please find

$E(x / x \geq E(x)) = ?$

20% (4) If given $e^x = x + c$, where $c \geq 1$, then answer the following:

(a) Whether x has a solution?

(b) How do you find the solution for x?

考試科目 Course	保險學	開課系級 Dept, & Class	保險系	日期 Date, Period	月 日 第 節	試題編號 CourseNo.	

共四題。每題二十五分。

國立政治大學圖書館

一. 何謂保單之現金價值（Cash Value）？其由何處產生？於改換展期定期保險（Extended Term Insurance）時應如何處理保單之現金價值？又於被保險人死亡時應如何處理保單之現金價值？再論保單之現金價值對保費費率之設定有何影響。

二. 試論責任保險之保險標的以及損害賠償責任成立所須具之要件。

三. 我國推動之重大社會保險工作，除全民健保外，下一重要之里程碑將為國民年金制度。試以社會保險之特性，探討國民年金制度應具有那些要件和特色？

四. 試以 (1). 保險利益（Insurable Interest），(2). 定值或不定值契約（Valued or Non-valued Policy），(3). 評價原理（Principle of Indemnity），(4). 複保險（Multiple Insurance）等四個方面討論和比較人壽保險和汽車保險可能有之差異。

保險學系　民法

一、請探討分析下列行為之效力：

(1)演員在戲劇中，簽發支票之行為。(15%)

國立政治大學圖書館

(2)甲(已婚，有子女二人)因與丙女發生婚外情，為維持與丙的關係，甲以自己為被保險人，向某保險公司購買五百萬元終身壽險，指定丙為受益人。此項指定受益人之行為？(10%)

二、「締約上過失」之意義為何？其理論基礎為何？我國現行民法有無相關之規定？試申論之？(25%)

三、(25%)

1. 甲於A公司擔任業務經理，因經手之帳目不清，遭公司解職，公司並以限時信函通知各來往廠商：「甲之解職事由」。
2. B公司收到解職通知，但仍未拆閱，洽巧甲前來拜訪，B公司盛情接待，甲見有機可乘，遂又代理A公司與B公司簽約，並收取廿萬元之訂金支票。

試分析：(1)甲與B公司訂立之契約，B公司可否主張對A公司生效？

(2)B公司如因此受有損失，可否請求甲賠償？

四、甲獨資經營書店，七十年一月一日乙向甲購書壹批約定一個月內付清價金，七十年三月一日甲將書店轉讓予丙經營，並簽立「商店轉讓證明書」載明所有權利、債務均由丙承受，丙於七十三年二月向乙請求付清價款。(25%)

試分析：(1)丙有無權利向乙請求付款？

(2)乙主張「甲、乙曾約定價金請求權，不得轉讓」，拒絕丙之請求是否有理由？

(3)如無前項約定，乙可否拒絕支付價金。

科目	統計學	開課系級 Dept, & Class	統計研究所 精算科學組	日期 Date, Period	4 月 27 日 第 2 節	試題編號 CourseNo.	68

研究生入學考試(100 %)

國立政治大學圖書館

1. (15%) Let $X_1, X_2, ..., X_n$ denote a random sample from a distribution that is $N(0, \theta)$.

   (a) Show that $Y = \sum X_i^2$ is a sufficient statistic for θ. (5%)

   (b) Find the best estimator of θ^2. (10%)

2. (20%) Given $f(x \mid \theta) = e^{-\frac{x}{\theta}}/\theta,\ \ x > 0,\ \pi(\theta) = \theta,\ \ 1 \le \theta \le \sqrt{3}$, and $L(\theta, a) = (a - \theta)^2$,

   (a) calculate $R(\theta, d)$ for $d_1(x) = X$, and $d_2(x) = X - 1$, and determine which is the minimax estimator with respect to these two estimators (10%),

   (b) calculate the Bayes solution with respect to these two estimators (10%).

3. (20%) Trinomial distribution is given by

$$f(x, y) = \frac{n!}{x!y!(n-x-y)!} p_1^x p_2^y p_3^{n-x-y},\ 0 \le p_i \le 1,\ \ p_1 + p_2 + p_3 = 1,\ \ x + y \le n$$

   (a) Prove or disprove that X and Y are stochastically dependent. (10 %)

   (b) find the probability density function of Y given $X = 5$ and the conditional mean and variance if $n = 10,\ p_1 = 0.1,\ p_2 = 0.2$. (10 %)

科目 rse	經計學	開課系級 Dept, & Class	保險所 精算研究組	日期 Date, Period	4 月 27 日 第 2 節	試題編號 CourseNo.	68

國立政治大學圖書館

4. (15%) Let the conditional probability that a person insured at age x will attain age x+t is given by

$$(\frac{1+x}{1+x+t})^3, \forall t > 0$$

(a) calculate the probability that this insured person will die within two years at age 20. (5 %)

(b) estimate this insured person's expected future life time at age 41. (10 %)

5. (10%) Under the assumption that

$$Y = X\beta + \epsilon,$$

ϵ has a normal distribution with mean 0 and covariance matrix $\sigma^2 \cdot I_n$, $\sigma^2 > 0$, explain that the ordinary least square (OLS) estimates and the MLE's of β coincide.

6. (20%) Let 20 independent trials of an experiment be such that x_1, x_2, x_3 are the respective numbers of times that the experiment ends in the mutually exclusive and exhaustive events C_1, C_2, C_3. If $p_i = P(C_i)$ is constant throughout the 20 trials, then

(a) write down the likelihood function. (5 %)

(b) find out the likelihood ratio test for testing $H_0 : p_1 = 0.5, p_2 = 0.3, p_3 = 0.2$, against all alternatives. (10 %)

(c) When the sample size is more than 20, say 1000, what is the appropriate test statistics to use and why. (5 %)

考試科目 Course	會計學	開課系級 Dept. & Class	保險所	日期 Date, Period	月 日 第 節	試題編號 Course No.

國立政治大學圖書館

1. On January 2, 19X1, Morse, Inc., purchased 3 used trucks at a total costs of $48,000. The company estimates that the trucks will remain in service for 6 years and have a residual value of $6,000. The trucks' combined annual mileage is expected to be 16,000 miles in each of the first 4 years and 18,000 miles in each of the next 2 years. Assume cash provided by operations before income tax is $80,000 for the trucks' first year. The income tax rate is 40%.

Required: (12%)
(1) Comparison of net income after tax for the first year. What is the advantage of Units-of-Output Method (UOP) over Double-Declining-Balance Method (DDB)?
(2) Comparison of the cash flow after tax for the first year. What is the advantage of Double-Declining-Balance Method (DDB) over Units-of-Output Method (UOP)?

2. BJ company purchased 1,000 units of terminal at the cost of $95 per unit on April 17. On August 19, the firm purchased another 1,200 units of terminals at the cost of $112 per unit. Sales data for the terminals are as follows:

Date	Units Sold
May 2	200
June 29	600
July 2	50
September 4	500
October 30	420

Assume Blix uses a **Perpetual Inventory System**.

Required: (10%)
Compute the value of the ending inventory on October 31 by using the following inventory methods:
(1) LIFO
(2) Weighted Average

3. Ali Company received a six-month Note receivable on Dec. 1, 1990 to replace $120,000 Account receivable. The note bears 10% interest rate and the interest is stated separately from the principal. On March 1, 1991, Ali Company discounted the Note receivable. The bank charged 16% discount rate. The fiscal year end of ABC is December 31.

Required: (10%)
Prepare the journal entry for March 1, 1991 according to the following assumption:
(1) Reversing entry was made.
(2) Reversing entry was not made.

國立政治大學圖書館

4. At June 30, 1990, the balance of the Cash account according to the books of Glenbarr Company was $25,095. The June 30 bank statement showed a balance of $37,539. Additional information are:

a. Deposit in transit at June 30, $8,500.
b. Outstanding checks in total $13,600.
c. Service charge by bank, $13.
d. A note receivable for $8,170 left by Glenbarr Company with bank for collection that had been collected and credited to company's account. No interest involved.
e. A check for $580 drawn by a customer, but deducted from Glenbarr's account by the bank and returned with the notation "NSF."
f. Glenbarr's check no. 480, issued in payment of $1,509 worth of office equipment, correctly written in the amount of $1,509 but erroneously recorded in Glenbarr's account records as $1,276.

Required: (10%)
Prepare a bank reconciliation for Glenbarr Company as June 30.

5. The partial adjusted trial balance for Overland Sales Company contains the following at December 31, 1991:

Inventory, January 1	30,000
B. Overland, Capital, January 1	72,500
B. Overland, Drawing	15,000
Sales	309,000
Purchases	184,000
Transportation-In	6,500
Depreciation Expense (Operating)	4,000
Utilities Expense (Operating)	3,000
Salaries Expense (Operating)	60,000
Interest Expense (Non-operating)	15,000

Overland's inventory at December 31, 1991, amounts to $39,000.

Required: (10%)
Prepare Overland's Income Statement for 1991, using multiple-step format.

6. NBC had 15,000 shares of common stock outstanding on January 1, 1996. They issued 3,000 shares of common on April 1, 1996 and 6,000 shares of common on September 1, 1996. Net income for 1996 was $38,000. NBC declared and paid preferred dividends of $700 and common dividends of $1,400.

Required: (5%)
Compute earnings per share for 1996.

國立政治大學圖書館

7. ABC company's balance sheet for December 1994 is as follows:

ABC Company
Balance Sheet
Dec. 31, 1994

Cash	$120
Other assets	300
Total assets	$420
Liability	$200
Owner's equity	220
Total liab. and O.E.	$420

According to the 1995 plan, the company needs cash for $80. The company is considering the following two alternatives to raise the required $80 cash:

Alternative 1: Use ABC as the borrowing entity to borrow $80 from the bank.

Alternative 2: Use other entity to borrow $80 from the bank and reinvest this fund ($80) to ABC.

Assume no other transactions for 1995.

Required: (15%)

(1) Prepare 1995 balance sheet for ABC if alternative 1 is used.
(2) Prepare 1995 balance sheet for ABC if alternative 2 is used.
(3) Which alternative will you recommend if ABC wants to show a better financial position? (Explanation is required.)

8. WCL company regularly sells merchandise on account to XYZ. Among the transactions between the two companies are the following:

Nov. 1 Sold 1,000 units of cotton sweaters to XYZ on account, terms, 1/10, n/30. These sweaters had cost WCL $32 per unit; the sale price to XYZ is $50 per sweater.

Nov. 4 XYZ returned 100 units of sweaters because they were wrong color. WCL gave the return allowance equal to the sale prices.

Nov. 9 XYZ paid within the discount period the remaining amount owed to WCL, after allowing the purchase return on November 5.

WCL uses <u>gross method</u> to record sales of merchandise. XYZ uses <u>net method</u> to record the purchases of merchandise.

Required: (18%)

Assume both companies use <u>periodic inventory systems.</u>

(1) Prepare journal entries to record these transactions for WCL (seller).
(2) Prepare journal entries to record these transactions for XYZ (purchaser)

考試科目 Course	會計學	開課系級 Dept. & Class	保險所	日期 Date, Period	月 日 第 節	試題編號 Course No.

國立政治大學圖書館

9. Acer purchased 40% of the voting stock of TI on January 1, 1991. During 1991, TI paid $5,000 in dividends and had net income of $43,000. During 1992, TI paid $6,000 in dividends and had net income of $52,000. The balance of the Investment on TI account in Acer's balance sheet at the end of 1992 was $63,800.

Required:(10%)
Compute the amount of Acer paid for the TI stock in 1991.

考試科目 Course	經濟學	開課系級 Dept. & Class	保險系	日期 Date, Period	月 日 第 節	試題編號 Course No.

Instructions:

國立政治大學圖書館

You have 100 minutes to answer the following questions. Be careful to provide brief but complete answers, and pay particular attention to graph labeling. Keep in mind the value of each question when you are allocating your time.

1. Kristen and Anna live in the beach town of Santa Monica. They own a small business in which they make wristbands and potholders and sell them to people on the beach. Kristen can make 15 wristbands per hour, but only 3 potholders. Anna is a bit slower and can make only 12 wristbands or 2 potholders in an hour.
a. (4 points) For Kristen, what is the opportunity cost of a potholder? For Anna? Who has a comparative advantage in the production of potholders? Explain.
b. (6 points) Suppose that Kristen and Anna can sell all their wristbands for $1 each and all their potholders for $5.50 each. If each of them worked 20 hours per week, how should they split their time between wristbands and potholders? What is their maximum joint revenue? Explain your answers.

2. In 1995 scientists conjectured that humans could get seriously ill from eating meat from cows affected by the "mad cow" disease. As a result, many European countries blocked meat imported from Britain, where infected cows had been repeatedly observed.
a. (5 points) Analyze the short-run effects of mad cow disease on the market for *chicken* meat in continental Europe.
b. (5 points) If the disease and the blockade continue for a long time, what will be the long-run effects on the market for chicken meat?
For both parts, explain your conclusions carefully and illustrate the situation with supply and demand curves.

3. (10 points) Many scientists are worried about the extinction of certain animals and plants as vast tracts of jungle in South America are converted into agricultural land. The concern is that the DNA, or genetic code, of a species is lost forever. The genetic code could provide important services in the future, such as the development of new drugs. What scheme could you develop to encourage farmers to preserve rare plants and animals? How can patents and established property rights to the preserved DNA fit into your scheme?

4. Consider an industry that consists of two equal-sized firms located in the United States. Their marginal cost of production is $2 at each level of output. The industry demand schedule is given in table 1. Assume that the two firms divide the market equally if they charge the same price for the product. If the prices are different, the firm with the lowest price takes the whole market.
a. (6 points) What will be the cartel price and quantity?
b. (6 points) What is the incentive for each firm to cheat on the agreement?
c. (3 points) Do you think the Department of Justice needs to intervene in this market and apply existing antitrust law? Why or why not?
d. (2 points) What price and quantity do we expect to observe in equilibrium in this industry?

P	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Q	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18

Table 1

5. (10 points) In 1960 the citizens of the United Kingdom had a per capita income four times that of the average citizen of Singapore. By 1990 the average citizens of the two countries had about the same levels of income. how can you explain that in terms of the growth model?

國立政治大學圖書館

6. A political party wins the presidency and the majority of congress with the message "no more defense spending".

a. (18 points) If people do not believe the new government will keep its promise, but defense spending is actually eliminated, what will happen in this economy in the short and long run? Use the ADI/PA model in your answer and analyze all relevant economic variables. (ADI represents Aggregate Demand / Inflation and PA represents Price Adjustment.)

b. (6 points) How would your answer change if people do believe the government is going to cut defense spending and adjust their price expectations immediately?

7. (19 points) The United States is currently enforcing a trade embargo on Cuba. Using the long-run shares of GDP model, analyze the effect of lifting the embargo on the Cuban economy.

統計學	開課系級 Dept, & Class	人資所 管理組	日期 Date, Period	4 月 27 日 第 2 節	試題編號 Course No.	6824

研究生入學考試(100 %)

國立政治大學圖書館

1. (10%)

Let X be a random variable to describe the claim severity with probability density function (p.d.f)

$$f(x) = \frac{1}{\pi}\frac{1}{1+x^2}, \quad -\infty < x < \infty,$$

(a) does EX exist? (5 %)

(b) Let $c > 0$ be finite, and let us truncate X at c by writing

$$X^c = \begin{cases} x & \text{if } |x| \le c \\ 0 & \text{if } |x| > c \end{cases}$$

find out the p.d.f of X^c , EX^c and $E(X^c)^2$. (5 %)

2. (20%)

Nine adults agreed to test the efficiency of a new diet program. Their weight (pounds) were measured before and after the program and found to be as follows:

	1	2	3	4	5	6	7	8	9
Before	132	139	126	114	122	132	142	119	126
After	124	141	118	116	114	132	145	123	121

(a) write down the model and the assumptions. (10 %)

(b) write down this test statistics (you need to find out the numerical value). (10 %)

3. (20%)

The following are the coded values of the amount of corn (in bushels pre acre) obtained from four varieties, using unequal numbers of plots for the different varieties:

```
A: 1, 3, 2
B: 3, 2, 4, 2
C: 7, 6, 4
```

(a) write down the model and the assumptions. (10 %)

(b) Construct the analysis of variance table and write down the test statistics. (you need to find out the numerical value) (10 %)

目 se	統計學	開課系級 Dept, & Class	保險所 管理組	日期 Date, Period	4 月 27 日 第 2 節	試題編號 CourseNo.	68

國立政治大學圖書館

4. (10%)

(a) Briefly explain the Neyman-Pearson Lemma. (5%)

(b) Let $X_1, X_2, .., X_5$ be i.i.d. $b(1,p)$ random variables, and let $H_0 : p = \frac{1}{2}, H_1 : p_1 = \frac{3}{4}$. Derive the Most Powerful (MP) Test of H_0 against H_1. (5 %)

5. (20%)

(a) Under the assumption that

$$Y = X\beta + \epsilon,$$

ϵ has a normal distribution with mean 0 and covariance matrix $\sigma^2 \cdot I_n$, $\sigma^2 > 0$, prove or disprove that the ordinary least square (OLS) estimates and the MLE's of β are the same. (10 %)

(b) When the observations Y are categorical, that is 0 or 1, what kind of adjustment is needed to change? Briefly explain your change. (10 %)

6. (20%)

For an individual, the probability of an accident of a given type in any 24-hour period, leading to an insurance claim, is 0.00037. The probabilities of claims on successive days are independent, and it is not possible to have more than one accident (leading to a claim) on the same day.

(a) Write down an appropriate statistical distribution to model the claim frequency and also its assumptions. (10 %)

(b) Calculate the probabilities that a policyholder makes 0,1 ,2 claims in a year. (10 %)

考試科目	保險法	課級	保險研究所（系組）	日期	月	日
節次	第	編號	試題			

一、我國保險法第十七條規定：「要保人或被保險人對於保險標物無保險利益者，保險契約失其效力。」是否妥當，試討論之。（30分）

二、我國保險法第一〇三條規定：「人壽保險人不得代位行使要保人或受益人因保險事故所生對於第三人之請求權。」此項規定並準用於健康保險、傷害保險及年金保險，是否妥當，試討論之。（30分）

三、定值保險與定值保險之意義與適用之險種為何？試說明之。（20分）

四、保險金額與保險價額之意義與其相互關係如何？試說之。（20分）