

考試科目	財政學	所別	財政學系	考試時間	2 月 27 日(日)第一節
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一、假設每個人只能活兩期。僅在第一期有工作能力，第二期若欲消費，須仰賴第一期的儲蓄。試問，若對利息所得課一比例稅，此舉對均衡的儲蓄量有何影響？(10 分)

二、假設全國僅有 X 與 Y 兩種財貨，分別由兩個完全競爭產業生產。兩產業均使用勞動與資本兩種生產要素，且兩生產要素可在兩產業間自由移動。此外，X 產業的資本勞動比(capital-labor ratio) 低於 Y 產業之資本勞動比。試利用 Harberger 模型回答以下問題(請列出必要之假設)：

- (1) 若政府對 Y 產業的產出課稅，其租稅歸宿為何？(10 分)
- (2) 若政府僅對 X 產業使用的資本課稅，其租稅歸宿又為何？(10 分)

三、名詞解釋

- (1) excess burden (5 分)
- (2) the Corlett-Hague rule (5 分)
- (3) user cost of capital (5 分)
- (4) tax evasion (5 分)

四、請簡要評論下列短句正確與否：(18%)

- (1) 「Merit goods will be over supplied and over consumed in a free market economy driven by traditional notions of consumer sovereignty.」(參考出處：Musgrave, 1959)
- (2) 「Carbon dioxide emissions from one country affect all countries through their impact on global climate. Hence CO₂ emissions are qualified as International Public Goods.」(參考出處：UNCTAD, 2002)
- (3) 「Majority rule is acceptable in a free society precisely because it allows a sort of jockeying back and forth among alternatives, upon none of which relative unanimity can be obtained. Hence Arrow's Impossibility Theorem is correct and valuable to democracy.」(參考出處：Buchanan, 1960)

請注意：背面還有試題。

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五、(15%)

- (1) 請簡述我國自民國 97 年起實施的「工作所得補助方案」或稱「工作家庭所得保障方案」的方案內容與權責機構。
- (2) 上述方案常與「近貧補助」、「負所得稅」或是美國境內實施的「EITC(Earned Income Tax Credit)」(一般翻譯為：薪資所得租稅抵減制度)相提並論，請說明這類型的方案應歸類、定位為「租稅制度」還是「社會福利制度」？
- (3) 若有人主張以新開徵「奢侈稅」來支應五之(1)所述方案需要的經費額度，你認為是否恰當？需說明你的立論基礎/價值體系。

六、(17%)

某大都會區的新任市長，為了實踐競選時的交通運輸 3-8 提昇政策：「3 環 8 線，我必做到」，上任後要求交通局評估該計畫的可行性，並指定需以現值法評定。交通局的調研資料如下：

典型的該都會居民，若利用現有捷運系統，可花費 40 分鐘（票價 \$ 40）通勤；也可以換搭兩段公車通勤，但須花費 60 分鐘（票價 \$ 30）。對他而言，兩種方式並無太大差異(indifferent)，數據顯示，他每年通勤 50 次。交通局評估：若 3 環 8 線通車後，預計可節省通勤族 20 分鐘之每次通勤時間。全市通勤人數共有 100 萬人，交通時間之縮短與費率之提高均自明年起實施，且持續無限期。

- (1) 對該都會區之代表性的個人通勤族而言，節省 1 分鐘的通勤時間等同於結餘多少所得？
- (2) 目前市場利率水準為 4 %，且未來年度也預計沒有變化。若明年年初起，3 環 8 線方案即能通車，且交通便利程度可持續至無限期，則對該都會區之代表性的個人通勤族而言，現值法會顯示出 3 環 8 線方案的效益現值(Benefits in Present-Value Terms)有多大？(提示資訊：
$$\sum_{i=1}^{\infty} \frac{x}{(1+r)^i} = \frac{x}{(1+r)^1} + \frac{x}{(1+r)^2} + \dots = \frac{x}{r}$$
)
- (3) 若所有工程支出與社會負擔均在本年度(當期)一次性認列，要在何種成本規模(Cost in Present-Value Terms)下，現值法才能判定 3-8 方案可行，值得推動？

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1. State whether the following statement is true or false and explain graphically why you say so. (10 points)

“Using a Solow model, it is possible to show that the saving rate that achieves the maximal long-run GDP level also achieves the highest long-run consumption level.”

2. Chairman of US Federal Reserve, Ben Bernanke, announced a second round of quantitative easing measures, or QE2. This means the Fed will begin a new round of bond buying and keep interest rates low. How QE2 could affect US economy? (10 points) Will QE2 affect emerging markets? If so, in what way? Explain graphically. (10 points)
3. Suppose that a large open economy increases its government spending. Explain the following graphically.
- 1) What happens to the world interest rate? (5 points)
 - 2) What happens to investment in a small open economy? (5 points)
 - 3) Suppose originally this small open economy has a balanced trade. What happens to trade balance after the change in global saving? (5 points)
 - 4) What happens to the real exchange rate? (5 points)

備註 試題隨卷繳交

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4.	Jason won \$ L in the government lottery. Jason's utility function for consumption goods per day (C) and hours of leisure per day (ℓ) is		$U(C, \ell) = C + \ln \ell.$	10%	
a.	After winning the lottery, does Jason change his work hours each day?			5%	
b.	What is the income effect of Jason's lottery gains on the amount of goods he buy per day?			5%	
5.	Draw graphs to illustrate the <i>short run</i> and <i>long-run</i> tax incidence analysis of a unit tax for a constant-cost industry in a competitive market with identical firms. What are the differences of predictions between these two analyses?			15%	
6.	Consider an industry of natural monopoly,			15%	
a.	What could the government intervene to do with this kind of industry about the price setting? What are the potential problems associated with these direct price regulations?			10%	
b.	How might the use of second-degree price discrimination help solve the inefficiency problem associated with a regulated monopolist?			5%	
備註	試題隨卷繳交				

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7. Suppose the management and the labor union of a firm are bargaining 10% over the share of the firm's product that will go to the two respective parties. The company charter specifies that management and labor must reach an agreement in three rounds of negotiation; otherwise, the dispute will be referred to the court—a long and costly process that both parties would prefer to avoid if possible.

The negotiations occurs in the following pattern:

- In the first round, the management proposes. If the labor union refuses the management's proposal, it has to make a counterproposal in the second round.
- If management refuses labor union's proposal, it has to make yet another proposal in the third and final round.
- If the labor union refuses management's offer, the case is then refer to the court.

Suppose that the value of the firm's product is 1 in the first round and both parties discount future earnings by 5% each round; that is, the firm's product is worth 0.95 in the second round and 0.9025 in the third round. If an agreement is not reached in the third round, the value of firm's product becomes zero.

- a. Describe the outcome of the negotiation; that is, at what stage will the negotiation be conclude and with what shares accruing to the two parties? 6%
- b. What will the outcome be if the labor union makes the first proposal? 4%

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【請詳列計算過程；否則不予計分。】

一、指南海運公司於民國 96 年初購買一艘郵輪作載客營運之用，該郵輪經認定為一現金產生單位，購買金額為 \$500,000,000，估計剩餘耐用年限為 10 年，無殘值，並以年數合計法提列折舊。指南公司於民國 100 年初發現所處產業環境受到諸多不利因素之影響，經公司評估減損測試後，預估未來每年淨現金流入約為 \$100,000,000，剩餘耐用年限縮短為 2 年，並決定改採直線法提列折舊，折現率為 12%，折現值為 \$169,005,102。請作指南海運公司民國 100 年之郵輪資產價值減損損失分錄 (5%)，以及民國 100 年的郵輪折舊分錄。(5%)

二、道南美容用品店民國 99 年度及 100 年度之銷貨成本資料列示如下：

	99 年	100 年
銷貨成本：		
期初存貨	\$ 400,000	\$ 600,000
進貨成本	3,000,000	3,500,000
可供銷貨商品成本	\$3,400,000	\$4,100,000
期末存貨	600,000	700,000
銷貨成本	\$2,800,000	\$3,400,000

會計師查帳時發現下列兩項錯誤：

- (A) 民國 99 年期初存貨高估 \$10,000，期末存貨低估 \$8,000。
- (B) 民國 100 年期末存貨高估 \$5,000。

試作：

計算道南美容用品店 99 年及 100 年之正確銷貨成本。(6%)

請注意：背面還有試題。

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三、下列為化南公司民國 99 年底時之股東權益相關資料：

普通股 (面額 \$10)	\$15,000,000
資本公積—庫藏股票交易	20,000
資本公積—普通股發行溢價	800,000
保留盈餘	27,995,000
庫藏股 (50,000 股，成本)	(750,000)

已知化南公司於民國 98 及 99 年度並未有任何公司股票之交易，98 年度也未發放股利。該公司民國 99 年之稅後淨利為 \$3,190,000。試問：

- (1) 該公司民國 99 年之每股盈餘為若干？(4%)
- (2) 該公司民國 99 年之普通股股東權益報酬率為若干？(4%)
- (3) 如果該公司民國 99 年底普通股每股市價為 \$33，則該公司民國 99 年底普通股之股價淨值比 (P/B ratio) 為若干 (2%)？本益比 (P/E ratio) 為幾倍 (2%)？
- (4) 如果您持有化南公司普通股 2,000 股，而該公司宣布將發放普通股股利每股 \$3，其中包括 \$1 現金股利與 \$2 之股票股利 (即 20% 之股票股利)，請問您將會收到該公司分配給您多少現金與幾股股票？(2%)
- (5) 如果化南公司庫藏股交易都是於民國 99 年進行，購入後不久隨即於同年中出售 20,000 股，請問當初出售庫藏股之平均售價為若干？(4%)

四、阿房珠寶公司於 B.C. 206 年 5 月 15 日為項王放火焚燬，其中 50% 的存貨遭受損害，B.C. 206 年第 1 季與第 2 季的會計資料摘錄如下：

	第 1 季	第 2 季 (4/1~5/15)
期初存貨	\$204,600	\$186,600
進貨	1,919,850	1,416,000
進貨退回與折讓	116,262	66,000
進貨運費	38,412	22,200
期末存貨	186,600	?
銷貨收入	3,100,000	2,460,000
銷貨退回與折讓	100,000	60,000
銷貨運費	200,000	80,000

試作：

- (1) 計算 B.C. 206 年第 1 季之毛利率。(5%)
- (2) 依 B.C. 206 年第 1 季之毛利率估計火損存貨成本。(5%)

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五、道藩公司於民國 100 年 1 月 1 日出售公司債，面額 \$400,000，並採利息法攤銷該應付公司債之折、溢價。此公司債於民國 100 年 1 月 1 日發行，105 年 1 月 1 日到期，道藩公司於每年 12 月 31 日支付利息。下列為道藩公司第一期公司債攤銷表的相關資料：

期數	利息支付數	利息費用	溢(折)價攤銷	未攤銷溢(折)價	帳面價值
發行				?	\$439,926
1	\$40,000	\$35,194	?	?	?

試依據上述資料，回答下列問題：

- (1) 公司債的票面利率為何？(2%)
- (2) 發行日的市場利率為何？(2%)
- (3) 試做公司債發行分錄。(4%)
- (4) 試做民國 102 年 12 月 31 日之付息分錄。(4%)
- (5) 倘道藩公司原採直線法攤銷公司債發行之折、溢價，試做民國 103 年 12 月 31 日之付息分錄。(4%)

六、志希公司係採應收帳款餘額百分比法估列壞帳，所採用之壞帳估計率每年均固定。該公司民國 100 年度與銷貨、應收帳款有關之資料如下：

- (1) 民國 100 年初應收帳款餘額 \$150,000。
- (2) 賒銷 \$765,000，付款條件為 2/10，n/40。
- (3) 銷貨退回 \$15,000。
- (4) 帳款收現 \$661,500 (未包含已沖銷壞帳之收回 \$1,200)，其中 80% 在折扣期間收款。
- (5) 沖銷壞帳 \$9,000。
- (6) 100 年底提列壞帳 \$11,235。
- (7) 100 年底備抵壞帳餘額比 99 年底多 \$3,435。

試問：

- (1) 民國 100 年初備抵壞帳餘額應為若干？(6%)
- (2) 該公司估計壞帳率為多少？(6%)
- (3) 該公司若自 100 年度起改採賒銷淨額百分比法提列壞帳，估計壞帳率為 1%，則 100 年底應提列之壞帳金額應為多少？(6%)

請注意：背面還有試題。

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七、果夫公司 民國 99 年底資產負債表資料如下：

現金	\$ xxx	應付帳款	\$1,650,000
應收帳款	1,180,000	應付公司債	1,100,000
存貨	767,000		
土地	330,000	普通股股本	1,980,000
機器設備	2,310,000	保留盈餘	484,000
減：累計折舊	(451,000)		
專利權	440,000		
	<u>\$5,214,000</u>		<u>\$5,214,000</u>

又民國 100 年之交易資料如下：

- (1) 淨利 \$506,000
- (2) 民國 100 年期末現金餘額 \$1,012,000
- (3) 機器設備之折舊 \$132,000
- (4) 機器設備 (成本 \$220,000, 累計折舊 \$88,000) 以 \$110,000 出售, 且另支付現金 \$220,000 購買機器設備
- (5) 專利權攤銷 \$55,000
- (6) 應收帳款及存貨分別增加 \$165,000 及 \$154,000
- (7) 應付帳款增加 \$143,000
- (8) 發行應付公司債 \$550,000
- (9) 購買長期股票投資 \$176,000
- (10) 以 \$109,000 之成本購買庫藏股
- (11) 宣告並發放現金股利 \$320,000

試以上述資料計算 民國 99 年底果夫公司帳上之現金餘額 (2%)，並以間接法編製果夫公司民國 100 年之現金流量表 (20%)。

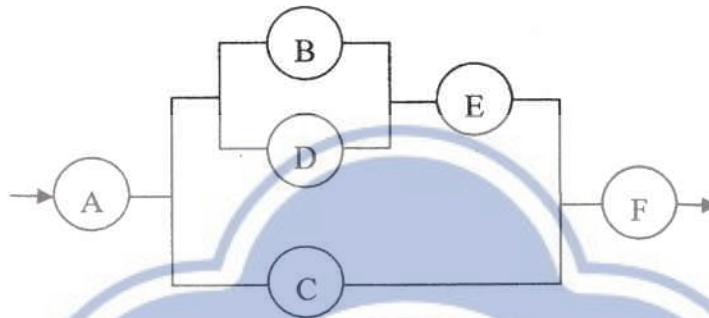
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<p>1. 假設某消費者的效用函數為 $u(x, y) = x^3 + xy + y^2$，試求其無異曲線的切線斜率。(12%)</p> <p>2. 試利用微分證明邊際成本線會通過平均成本線的最低點。(12%)</p> <p>3. 在經濟學中通常會以所謂的絕對風險係數，$r(W) = -\frac{u''(W)}{u'(W)}$，來衡量一個人的風險趨避程度，其中 W 代表某人的財富水準，$u(W)$ 為其效用函數，而效用水準僅取決於 W 的高低。請推導出絕對風險係數 $r(W)$ 在何種效用函數下將為固定的常數。(12%)</p> <p>4. 假定函數 $u(x, y) = (ax^\rho + (1-a)y^\rho)^{\frac{1}{\rho}}$，試求 $\lim_{\rho \rightarrow \infty} u(x, y) = ?$ (12%)</p> <p>5. 設函數 f 定義為 $f(x) = \frac{4x^2 - 1}{2x + 1}$，$x \neq -\frac{1}{2}$；若要使 f 在 $x = -\frac{1}{2}$ 為連續，則 $f(-\frac{1}{2})$ 應為何值？(12%)</p> <p>6. 求函數 $f(x) = \frac{1}{x^2}$ 在 $[1, 4]$ 之平均值。(12%)</p> <p>7. 關於函數 $f(x) = \frac{1}{x^2}$，(14%)</p> <p>(1) 試求出滿足均值定理 (mean value theorem) $f(a+h) = f(a) + hf'(c)$ 的 c ($a < c < a+h$)。</p> <p>(2) 若令 $c = a + h\theta$ ($0 < \theta < 1$)，試求 $\lim_{h \rightarrow 0} \theta$。</p> <p>8. 關於函數 $\Gamma(s) = \int_0^{\infty} e^{-x} x^{s-1} dx$，($s > 0$)，試證下列等式：(14%)</p> <p>(1) $\Gamma(s+1) = s\Gamma(s)$；</p> <p>(2) $\Gamma(n) = (n-1)!$，n 為正數。</p>					

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Do All Questions

Question 1 (10 points)

In a certain corporation, the protocol for making major decisions follows the flowchart shown below.



Any proposal is first screened by A. If he approves it, the document is forwarded to B, C, and D. If either B or D concurs, it goes to E. If either E or C say “yes”, it moves on to F for a final reading. Only if F is also in agreement does the measure pass. Suppose that A, C, and F each has a 50% chance of saying “yes”, whereas B, D, and E will each concur with probability 0.7. If everyone comes to a decision independently, what is the probability that a proposal will pass?

Question 2 (20 points, 5/5/5/5)

Assume that X and Y are jointly distributed with the following joint probability density function (pdf):

$$f_{X,Y}(x,y) = \begin{cases} c & \text{for } 0 < x < 1, \quad 0 < y < (1-x)^2 \\ 0 & \text{elsewhere} \end{cases}$$

Answer the following questions. Be sure to indicate the range of x and y where appropriate.

- (1) Find the value of c so that this is a proper joint density function.
- (2) Find the marginals $f_X(x)$ and $f_Y(y)$.
- (3) What is the pdf of Y given that $X = x$? What is the name of this distribution?
- (4) Compute $E(Y | X = x) = ?$

請注意：背面還有試題。

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Question 3 (15 points, 7/8)

Let y_1, \dots, y_T be a random sample from a normal distribution with $N(\mu, 1)$. The null hypothesis is $H_0: \mu = 0$ and the alternatives is $H_a: \mu > 0$. The critical region for this test is:

$$\bar{y} > c, \quad \bar{y} = T^{-1} \sum_{t=1}^T y_t$$

- (1) Please define the value of c if the size of the test is 0.05. (Size is the maximum probability of rejecting H_0 when H_0 is true.)
- (2) Calculate the power of a test if the size equal to 0.05 at the alternatives: $\mu = 0.4$ and $T=25$.

Question 4 (15 points, 7/8)

Consider the model: $y_t = x_t \beta + e_t$, $t = 1, 2, \dots, T$ where x_t is a single explanatory variable, β is a scalar unknown parameter, and $E(e_t) = 0$, $E(e_t^2) = \sigma_t^2$, $E(e_t e_s) = 0$, $t \neq s$.

Under what assumptions about σ_t^2 , will each of the following estimators be best linear unbiased?

$$(1) \hat{\beta} = \frac{\sum x_t y_t}{\sum x_t^2}$$

$$(2) \hat{\beta} = \frac{\sum y_t}{\sum x_t}$$

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Question 5 (20 points)

若 A 工廠 50 位員工過去一年的請假資料如下表所示：

請假天數	0	1	2	3	4	5
人數	22	17	6	4	1	0

根據上述資料，你/妳認為 A 工廠員工請假的天數最可能呈現何種分配？試以 $\alpha = 0.05$ 加以檢定。

Question 6 (20 points, 5/5/5/5)

隨機抽樣六家零售店同一商品的銷售資料如下：

	A	B	C	D	E	F
Y (銷售量)	100	110	140	125	120	95
X (單價)	31	30	29	30	31	32

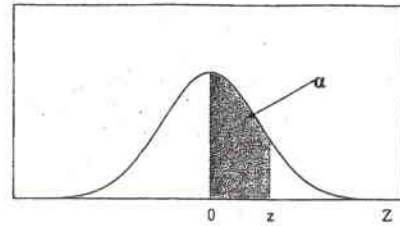
- (1) 請利用上述資料，以普通最小平方法求出迴歸估計方程式。
- (2) 試求判定係數。
- (3) 試求 $\sigma^2(Y|X)$ 之 95% 的信賴區間。
- (4) 試以 $\alpha = 0.05$ 檢定單價的迴歸估計值是否小於 -10。

請注意：背面還有試題。

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標準常態累加機率值表

$$P(0 < Z < z) = \alpha$$



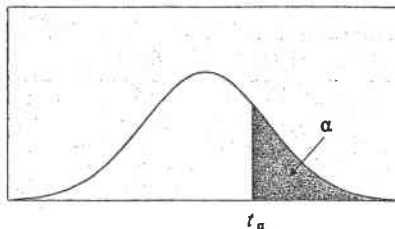
z	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
0.0	0.0000	0.0040	0.0080	0.0120	0.0160	0.0199	0.0239	0.0279	0.0319	0.0359
0.1	0.0398	0.0438	0.0478	0.0517	0.0557	0.0596	0.0636	0.0675	0.0714	0.0753
0.2	0.0793	0.0832	0.0871	0.0910	0.0948	0.0987	0.1026	0.1064	0.1103	0.1141
0.3	0.1179	0.1217	0.1255	0.1293	0.1331	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	0.3554	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	0.4783	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	0.4861	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	0.49865	0.49869	0.49874	0.49878	0.49882	0.49886	0.49889	0.49893	0.49897	0.49900
3.1	0.49903	0.49906	0.49910	0.49913	0.49916	0.49918	0.49921	0.49924	0.49926	0.49929
3.2	0.49931	0.49934	0.49936	0.49938	0.49940	0.49942	0.49944	0.49946	0.49948	0.49950
3.3	0.49952	0.49953	0.49955	0.49967	0.49958	0.49960	0.49961	0.49962	0.49964	0.49965
3.4	0.49966	0.49968	0.49969	0.49970	0.49971	0.49972	0.49973	0.49974	0.49975	0.49976
3.5	0.49977	0.49978	0.49978	0.49979	0.49980	0.49981	0.49981	0.49982	0.49983	0.49983
3.6	0.49984	0.49985	0.49985	0.49986	0.49986	0.49987	0.49987	0.49988	0.49988	0.49989
3.7	0.49989	0.49990	0.49990	0.49990	0.49991	0.49991	0.49992	0.49992	0.49992	0.49992
3.8	0.49993	0.49993	0.49993	0.49994	0.49994	0.49994	0.49994	0.49995	0.49995	0.49995
3.9	0.49995	0.49995	0.49996	0.49996	0.49996	0.49996	0.49996	0.49996	0.49997	0.49997
4.0	0.49996832									
4.5	0.49999660									
5.0	0.49999971									
5.5	0.49999998									
6.0	0.49999999									

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t 分配臨界值表

$$P(t > t_{\alpha}) = \alpha$$

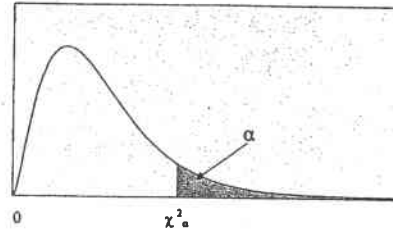


<i>d.f.</i>	<i>t</i> ₁₀₀	<i>t</i> ₀₅₀	<i>t</i> ₀₂₅	<i>t</i> ₀₁₀	<i>t</i> ₀₀₅	<i>d.f.</i>
1	3.078	6.314	12.706	31.821	63.656	1
2	1.886	2.920	4.303	6.965	9.925	2
3	1.638	2.353	3.182	4.541	5.841	3
4	1.533	2.132	2.776	3.747	4.604	4
5	1.476	2.015	2.571	3.365	4.032	5
6	1.440	1.943	2.447	3.143	3.707	6
7	1.415	1.895	2.365	2.998	3.499	7
8	1.397	1.860	2.306	2.896	3.355	8
9	1.383	1.833	2.262	2.821	3.250	9
10	1.372	1.812	2.228	2.764	3.169	10
11	1.363	1.796	2.201	2.718	3.106	11
12	1.356	1.782	2.179	2.681	3.055	12
13	1.350	1.771	2.160	2.650	3.012	13
14	1.345	1.761	2.145	2.624	2.977	14
15	1.341	1.753	2.131	2.602	2.947	15
16	1.337	1.746	2.120	2.583	2.921	16
17	1.333	1.740	2.110	2.567	2.898	17
18	1.330	1.734	2.101	2.552	2.878	18
19	1.328	1.729	2.093	2.539	2.861	19
20	1.325	1.725	2.086	2.528	2.845	20
21	1.323	1.721	2.080	2.518	2.831	21
22	1.321	1.717	2.074	2.508	2.819	22
23	1.319	1.714	2.069	2.500	2.807	23
24	1.318	1.711	2.064	2.492	2.797	24
25	1.316	1.708	2.060	2.485	2.787	25
26	1.315	1.706	2.056	2.479	2.779	26
27	1.314	1.703	2.052	2.473	2.771	27
28	1.313	1.701	2.048	2.467	2.763	28
29	1.311	1.699	2.045	2.462	2.756	29
30	1.310	1.697	2.042	2.457	2.750	30
31	1.310	1.696	2.040	2.453	2.744	31
32	1.309	1.694	2.037	2.449	2.739	32
33	1.308	1.692	2.035	2.445	2.733	33
34	1.307	1.691	2.032	2.441	2.728	34
35	1.306	1.690	2.030	2.438	2.724	35
36	1.306	1.688	2.028	2.435	2.720	36
37	1.305	1.687	2.026	2.431	2.715	37
38	1.304	1.686	2.024	2.429	2.712	38
39	1.304	1.685	2.023	2.426	2.708	39
40	1.303	1.684	2.021	2.423	2.705	40

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卡方分配臨界值表

$$P(\chi^2 > \chi^2_\alpha) = \alpha$$



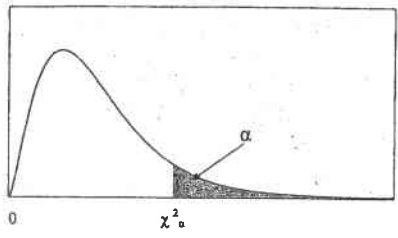
df.	$\chi^2_{0.995}$	$\chi^2_{0.990}$	$\chi^2_{0.975}$	$\chi^2_{0.950}$	$\chi^2_{0.900}$
1	0.0000393	0.0001571	0.0009821	0.0039322	0.0157907
2	0.0100247	0.0201004	0.0506357	0.1025862	0.2107208
3	0.0717235	0.1148316	0.2157949	0.3518460	0.5843755
4	0.206984	0.297107	0.484419	0.710724	1.063624
5	0.411751	0.554297	0.831209	1.145477	1.610309
6	0.675733	0.872083	1.237342	1.635380	2.204130
7	0.989251	1.239032	1.689864	2.167349	2.833105
8	1.344403	1.646506	2.179725	2.732633	3.489537
9	1.734911	2.087889	2.700389	3.325115	4.168156
10	2.155845	2.558199	3.246963	3.940295	4.865178
11	2.603202	3.053496	3.815742	4.574809	5.577788
12	3.073785	3.570551	4.403778	5.226028	6.303796
13	3.565042	4.106900	5.008738	5.891861	7.041500
14	4.074659	4.660415	5.628724	6.570632	7.789538
15	4.600874	5.229356	6.262123	7.260935	8.546753
16	5.142164	5.812197	6.907664	7.961639	9.312235
17	5.697274	6.407742	7.564179	8.671754	10.0852
18	6.264766	7.014903	8.230737	9.390448	10.8649
19	6.843923	7.632698	8.906514	10.1170	11.6509
20	7.433811	8.260368	9.590772	10.8508	12.4426
21	8.033602	8.897172	10.2829	11.5913	13.2396
22	8.642681	9.542494	10.9823	12.3380	14.0415
23	9.260383	10.1957	11.6885	13.0905	14.8480
24	9.886199	10.8563	12.4011	13.8484	15.6587
25	10.5196	11.5240	13.1197	14.6114	16.4734
26	11.1602	12.1982	13.8439	15.3792	17.2919
27	11.8077	12.8785	14.5734	16.1514	18.1139
28	12.4613	13.5647	15.3079	16.9279	18.9392
29	13.1211	14.2564	16.0471	17.7084	19.7677
30	13.7867	14.9535	16.7908	18.4927	20.5992
40	20.7066	22.1642	24.4331	26.5093	29.0505
50	27.9908	29.7067	32.3574	34.7642	37.6886
60	35.5344	37.4848	40.4817	43.1880	46.4589
80	51.1719	53.5400	57.1532	60.3915	64.2778
100	67.3275	70.0650	74.2219	77.9294	82.3581

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卡方分配臨界值表
(續)

$$P(\chi^2 > \chi^2_\alpha) = \alpha$$



$\chi^2_{0.100}$	$\chi^2_{0.050}$	$\chi^2_{0.025}$	$\chi^2_{0.010}$	$\chi^2_{0.005}$	d.f.
2.705541	3.841455	5.023903	6.634891	7.879400	1
4.605176	5.991476	7.377779	9.210351	10.5965	2
6.251394	7.814725	9.348404	11.3449	12.8381	3
7.779434	9.487728	11.1433	13.2767	14.8602	4
9.236349	11.0705	12.8325	15.0863	16.7496	5
10.6446	12.5916	14.4494	16.8119	18.5475	6
12.0170	14.0671	16.0128	18.4753	20.2777	7
13.3616	15.5073	17.5345	20.0902	21.9549	8
14.6837	16.9190	19.0228	21.6660	23.5893	9
15.9872	18.3070	20.4832	23.2093	25.1881	10
17.2750	19.6752	21.9200	24.7250	26.7569	11
18.5493	21.0261	23.3367	26.2170	28.2997	12
19.8119	22.3620	24.7356	27.6882	29.8193	13
21.0641	23.6848	26.1189	29.1412	31.3194	14
22.3071	24.9958	27.4884	30.5780	32.8015	15
23.5418	26.2962	28.8453	31.9999	34.2671	16
24.7690	27.5871	30.1910	33.4087	35.7184	17
25.9894	28.8693	31.5264	34.8052	37.1564	18
27.2036	30.1435	32.8523	36.1908	38.5821	19
28.4120	31.4104	34.1696	37.5663	39.9969	20
29.6151	32.6706	35.4789	38.9322	41.4009	21
30.8133	33.9245	36.7807	40.2894	42.7957	22
32.0069	35.1725	38.0756	41.6383	44.1814	23
33.1962	36.4150	39.3641	42.9798	45.5584	24
34.3816	37.6525	40.6465	44.3140	46.9280	25
35.5632	38.8851	41.9231	45.6416	48.2898	26
36.7412	40.1133	43.1945	46.9628	49.6450	27
37.9159	41.3372	44.4608	48.2782	50.9936	28
39.0875	42.5569	45.7223	49.5878	52.3355	29
40.2560	43.7730	46.9792	50.8922	53.6719	30
51.8050	55.7585	59.3417	63.6908	66.7660	40
63.1671	67.5048	71.4202	76.1538	79.4898	50
74.3970	79.0820	83.2977	88.3794	91.9518	60
96.5782	101.879	106.629	112.329	116.321	80
118.498	124.342	129.561	135.807	140.170	100

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泊松分配機率值表 $P(X=x) = \frac{e^{-\lambda} \lambda^x}{x!}$

x	λ									
	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
0	.9048	.8187	.7408	.6703	.6065	.5488	.4966	.4493	.4066	.3679
1	.0905	.1637	.2222	.2681	.3033	.3293	.3476	.3595	.3659	.3679
2	.0045	.0164	.0333	.0536	.0758	.0988	.1217	.1438	.1647	.1839
3	.0002	.0011	.0033	.0072	.0126	.0198	.0284	.0383	.0494	.0613
4	.0000	.0001	.0003	.0007	.0016	.0030	.0050	.0077	.0111	.0153
5	.0000	.0000	.0000	.0001	.0002	.0004	.0007	.0012	.0020	.0031
6	.0000	.0000	.0000	.0000	.0000	.0000	.0001	.0002	.0003	.0005
7	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0001

x	λ									
	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0
0	.2231	.1353	.0821	.0498	.0302	.0183	.0111	.0067	.0041	.0025
1	.3347	.2707	.2052	.1494	.1057	.0733	.0500	.0337	.0225	.0149
2	.2510	.2707	.2565	.2240	.1850	.1465	.1125	.0842	.0618	.0446
3	.1255	.1804	.2138	.2240	.2158	.1954	.1687	.1404	.1133	.0892
4	.0471	.0902	.1336	.1680	.1888	.1954	.1898	.1755	.1558	.1339
5	.0141	.0361	.0668	.1008	.1322	.1563	.1708	.1755	.1714	.1606
6	.0035	.0120	.0278	.0504	.0771	.1042	.1281	.1462	.1571	.1606
7	.0008	.0034	.0099	.0216	.0385	.0595	.0824	.1044	.1234	.1377
8	.0001	.0009	.0031	.0081	.0169	.0298	.0463	.0653	.0849	.1033
9	.0000	.0002	.0009	.0027	.0066	.0132	.0232	.0363	.0519	.0688
10	.0000	.0000	.0002	.0008	.0023	.0053	.0104	.0181	.0285	.0413
11	.0000	.0000	.0000	.0002	.0007	.0019	.0043	.0082	.0143	.0225
12	.0000	.0000	.0000	.0001	.0002	.0006	.0016	.0034	.0065	.0113
13	.0000	.0000	.0000	.0000	.0001	.0002	.0006	.0013	.0028	.0052
14	.0000	.0000	.0000	.0000	.0000	.0001	.0002	.0005	.0011	.0022
15	.0000	.0000	.0000	.0000	.0000	.0000	.0001	.0002	.0004	.0009
16	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0001	.0003
17	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0001

考試科目	統計學	所別	財政所	考試時間	2 月 27 日(日) 第四節
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泊松分配機率值表 (續)

$$P(X = x) = \frac{e^{-\lambda} \lambda^x}{x!}$$

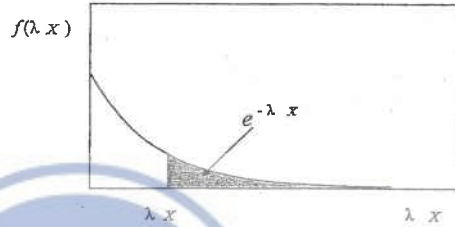
x	λ									
	6.5	7.5	8.5	9.0	9.5	10.0	11.0	12.0	15.0	20.0
0	.0015	.0006	.0002	.0001	.0001	.0000	.0000	.0000	.0000	.0000
1	.0098	.0041	.0017	.0011	.0007	.0005	.0002	.0001	.0000	.0000
2	.0318	.0156	.0074	.0050	.0034	.0023	.0010	.0004	.0000	.0000
3	.0688	.0389	.0208	.0150	.0107	.0076	.0037	.0018	.0002	.0000
4	.1118	.0729	.0443	.0337	.0254	.0189	.0102	.0053	.0006	.0000
5	.1454	.1094	.0752	.0607	.0483	.0378	.0224	.0127	.0019	.0001
6	.1575	.1367	.1066	.0911	.0764	.0631	.0411	.0255	.0048	.0002
7	.1462	.1465	.1294	.1171	.1037	.0901	.0646	.0437	.0104	.0005
8	.1188	.1373	.1375	.1318	.1232	.1126	.0888	.0655	.0194	.0013
9	.0858	.1144	.1299	.1318	.1300	.1251	.1085	.0874	.0324	.0029
10	.0558	.0858	.1104	.1186	.1235	.1251	.1194	.1048	.0486	.0058
11	.0330	.0585	.0853	.0970	.1067	.1137	.1194	.1144	.0663	.0106
12	.0179	.0366	.0604	.0728	.0844	.0948	.1094	.1144	.0829	.0176
13	.0089	.0211	.0395	.0504	.0617	.0729	.0926	.1056	.0956	.0271
14	.0041	.0113	.0240	.0324	.0419	.0521	.0728	.0905	.1024	.0387
15	.0018	.0057	.0136	.0194	.0265	.0347	.0534	.0724	.1024	.0516
16	.0007	.0026	.0072	.0109	.0157	.0217	.0367	.0543	.0960	.0646
17	.0003	.0012	.0036	.0058	.0088	.0128	.0237	.0383	.0847	.0760
18	.0001	.0005	.0017	.0029	.0046	.0071	.0145	.0255	.0706	.0844
19	.0000	.0002	.0008	.0014	.0023	.0037	.0084	.0161	.0557	.0888
20	.0000	.0001	.0003	.0006	.0011	.0019	.0046	.0097	.0418	.0888
21	.0000	.0000	.0001	.0003	.0005	.0009	.0024	.0055	.0299	.0846
22	.0000	.0000	.0001	.0001	.0002	.0004	.0012	.0030	.0204	.0769
23	.0000	.0000	.0000	.0000	.0001	.0002	.0006	.0016	.0133	.0669
24	.0000	.0000	.0000	.0000	.0000	.0001	.0003	.0008	.0083	.0557
25	.0000	.0000	.0000	.0000	.0000	.0000	.0001	.0004	.0050	.0446
26	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0002	.0029	.0343
27	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0001	.0016	.0254
28	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0009	.0181
29	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0004	.0125
30	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0002	.0083
31	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0001	.0054
32	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0001	.0034
33	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0020
34	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0012
35	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0007
36	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0004
37	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0002
38	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0001
39	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0001

備註 試題隨卷繳交

請注意：背面還有試題。

考試科目	統計學	所別	財政所	考試時間	2月27日(日) 第四節
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指數分配函數



λx	$e^{-\lambda x}$	λx	$e^{-\lambda x}$	λx	$e^{-\lambda x}$	λx	$e^{-\lambda x}$
0.0	1.000	2.5	0.082	5.0	0.0067	7.5	0.0006
0.1	0.905	2.6	0.074	5.1	0.0061	7.6	0.0005
0.2	0.819	2.7	0.067	5.2	0.0055	7.7	0.0005
0.3	0.741	2.8	0.061	5.3	0.0050	7.8	0.0004
0.4	0.670	2.9	0.055	5.4	0.0045	7.9	0.0004
0.5	0.607	3.0	0.050	5.5	0.0041	8.0	0.0003
0.6	0.549	3.1	0.045	5.6	0.0037	8.1	0.0003
0.7	0.497	3.2	0.041	5.7	0.0033	8.2	0.0003
0.8	0.449	3.3	0.037	5.8	0.0030	8.3	0.0002
0.9	0.407	3.4	0.033	5.9	0.0027	8.4	0.0002
1.0	0.368	3.5	0.030	6.0	0.0025	8.5	0.0002
1.1	0.333	3.6	0.027	6.1	0.0022	8.6	0.0002
1.2	0.301	3.7	0.025	6.2	0.0020	8.7	0.0002
1.3	0.273	3.8	0.022	6.3	0.0018	8.8	0.0002
1.4	0.247	3.9	0.020	6.4	0.0017	8.9	0.0001
1.5	0.223	4.0	0.018	6.5	0.0015	9.0	0.0001
1.6	0.202	4.1	0.017	6.6	0.0014	9.1	0.0001
1.7	0.183	4.2	0.015	6.7	0.0012	9.2	0.0001
1.8	0.165	4.3	0.014	6.8	0.0011	9.3	0.0001
1.9	0.150	4.4	0.012	6.9	0.0010	9.4	0.0001
2.0	0.135	4.5	0.011	7.0	0.0009	9.5	0.0001
2.1	0.122	4.6	0.010	7.1	0.0008	9.6	0.0001
2.2	0.111	4.7	0.009	7.2	0.0007	9.7	0.0001
2.3	0.100	4.8	0.008	7.3	0.0007	9.8	0.0001
2.4	0.091	4.9	0.007	7.4	0.0006	9.9	0.0001