國立政治大學九十七學年度研究所碩士班入學考試命題紙

考試科目	保險法	所別	4181 風管所 法律組	考試時間	3月16日 星期日 第一節

問答題：（每題二十五分）

一、被保險人違反危險增加通知義務之效果為何？健康保險之被保險人於投保後罹患高血壓，是否為危險增加而應負通知義務？
試依保險法相關規定說明之。

二、現行實務運作下，遊樂場、雇主、學校為其遊客、員工或學生投保團體傷害保險時有無保險利益？
試依學理與保險法相關規定論述之。

三、人壽保險之受益人如何產生？受益人謀殺被保險人與要保人謀殺被保險人，二者在法律效果有何差異？
試依保險法相關規定說明之。

四、保證保險之保險利益何在？保證保險與信用保險有何不同？保險公司能否經營「保證」業務？
試依學理與保險法相關規定論述之。

備考	試題隨卷繳交
命題委員：	（簽章） 年 月 日

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國立政治大學九十七學年度研究所博碩士班入學考試命題紙

考試科目	民法	所別	風保學系 4184	考試時間	3月16日 星期日 第3節

第一題：25%

解釋下列名詞之法律意義與效力：

（一）權利能力、行爲能力與責任能力

（二）連帶債務與連帶債權

（三）時效中斷與時效不完成

（四）債權行爲與物權行爲

（五）條件與期限

第二題：25%

無代理權而爲代理行爲，該代理行爲之效力爲何？

第三題：25%

有許多學者認爲保險契約爲損害賠償發生原因之一，試就此一論點析述己見。

第四題：25%

試就「強制汽車責任保險法」、「公路法」及「民法」有關規定，說明汽車交通事故造成他人損害時，加害人應負賠償責任之歸責原則或事由。

備考	試題隨卷繳交

命題委員：　　（簽章）　　年　　月　　日

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國立政治大學九十七 學年度研究所博碩士班入學考試命題紙

考試科目	經濟學	所別	4182 風管系管理組	考試時間	3月16日 星期日 第1節

本科目之選擇題請在答案卡上作答

I. Multiple Questions (單選題，每題五分)

1. Suppose a worker at a computer company rearranges existing machines and labor and increases production in the process. Using the production function, with output on the vertical axis and labor on the horizontal axis, this would be described as
   a. an upward shift of the curve combined with an upward movement along the curve.
   b. a movement upward along the curve.
   c. a movement downward along the curve.
   d. a downward shift of the curve.
   e. an upward shift of the curve.

2. Because marginal product decreases as input is increased
   a. nothing is implied about how much input is required to produce one more unit of output.
   b. it takes decreasing amounts of input to produce one more unit of output.
   c. it takes increasing amounts of input to produce one more unit of output.
   d. the amount of input it takes to produce one more unit of output does not change.
   e. it takes zero input to produce one more unit of output.

3. With monopolistic competition, market demand is
   a. constantly changing.
   b. horizontal.
   c. the same as firm demand.
   d. nonexistent.
   e. like any other market demand.

4. Reputation and cooperation are more difficult to achieve when
   a. firms find it difficult to observe the behavior of other firms.
   b. a game is repeated.
   c. there are only two firms as opposed to having three or more firms.
   d. firms can easily observe what the others are doing.
   e. firms act out of their own self-interest.

備考	試題隨卷繳交
命題委員：	（簽章） 年 月 日

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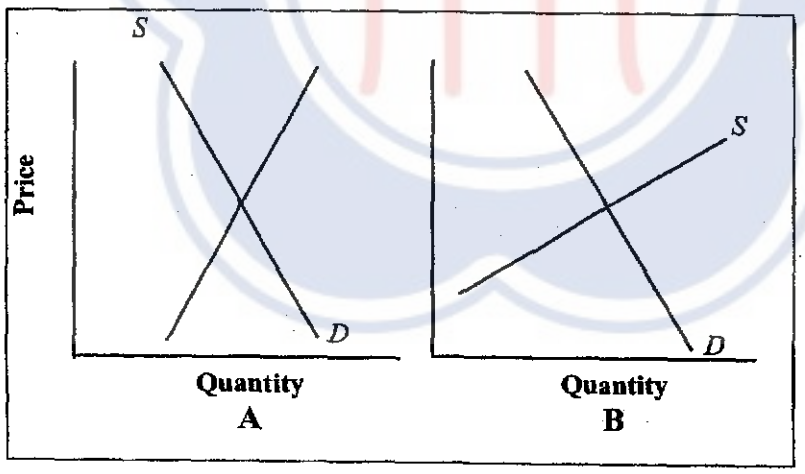
考試科目	經濟學	所別	4182 風管系管理組	考試時間	3月16日 星期日 第1節

5. The chance a firm takes in defecting from a cooperative solution to a game is that
   a. the firm will immediately suffer lower profits as a result of defecting.
   b. the noncooperative solution causes profits to fall.
   c. cooperation will result in lower profits in the future.
   d. cooperation will be difficult to reestablish and profits will be sacrificed.
   e. all firms know the actions of each other.

6. Refer to the figure below. Which of the following statements is true?
   a. A per-unit tax will result in the greatest reduction of output in the market illustrated in Figure B.
   b. No deadweight loss from a per-unit tax will result in either of the markets illustrated.
   c. A per-unit tax will result in the greatest deadweight loss in the market illustrated in Figure A.
   d. A per-unit tax will result in the greatest loss of consumer surplus in the market illustrated in Figure A.
   e. A per-unit tax will result in the smallest price change in the market illustrated in Figure A.



7. The effect of the personal income tax on the amount of labor employed in the economy is greatest when
   a. demand and supply are both relatively elastic.
   b. demand and supply are both relatively inelastic.
   c. demand is relatively inelastic and supply is relatively elastic.
   d. demand is relatively elastic and supply is relatively inelastic.
   e. both supply and demand do not exist.

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	經濟學	所別	4182 風管系，管理組	考試時間	3月16日 星期日 第1節

8. In looking at the distribution of income provided by quintile statistics and the Lorenz curve, it must be kept in mind that
   a. all individuals with high incomes have a lot of wealth, whereas all individuals with low incomes have very little wealth.
   b. those who are poor generally stay poor, and those who are rich generally stay rich.
   c. when families split up, the two new families formed move down in terms of income into lower quintiles.
   d. income per person is being measured.

9. Radio and television broadcasting services partially avoid a free-rider problem by
   a. using advertising to pay for the services.
   b. converting the services from excludable to nonexcludable goods.
   c. converting the services from private to public goods.
   d. broadcasting unscrambled programs through the air.
   e. charging the government for their services.

10. The Coase theorem works provided that
   a. the transactions costs of an agreement are above a high level.
   b. the transactions costs associated with an agreement are low compared to the costs of the externality itself.
   c. the costs of an externality itself are low compared to the transactions costs of an agreement.
   d. both parties are willing to negotiate with each other.
   e. transactions costs of an agreement are high compared to the costs of the externality itself.

11. Emission taxes have an advantage over taxes on production in that
   a. they change the firm's output whereas taxes on production do not.
   b. the firm's amount of pollution associated with its production will not change.
   c. the firm can use technology to change the amount of pollution associated with its production.
   d. they do not raise the firm's prices whereas taxes on production do.
   e. the firm can increase the amount of pollution associated with a given amount of production.

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	經濟學	所別	4182 風管系管理組	考試時間	3月16日 星期日 第1節

12. Which of the following statements is true when the Fed increases reserves by buying a government bond from a bank?
    a. The amount of reserves in the banking system will increase by an amount greater than the amount of the bond purchase.
    b. The amount of loans made by the banking system will increase by the amount of the bond purchase.
    c. The amount of loans made by that bank will be greater than the increase in reserves.
    d. The amount of deposits made by the banking system will increase by the amount of the bond purchase.
    e. The amount of reserves in the banking system will increase by the amount of the bond purchase.

13. Which of the following statements is true?
    a. Markets respond to consumer preferences, whereas government responds only to societal preferences.
    b. Markets keep costs low out of producers' desires to please people, regardless of cost.
    c. Government keeps costs low due to its moral obligations to voters.
    d. It is safe to assume that government will do what is best for society whereas markets do what is best for owners of businesses.
    e. The lack of profit motive encourages supervisors in government agencies to make decisions concerning employees on the basis of issues other than merit.

II. Firm X and firm Y are the only two Internet providers in a small town. The demand for Internet subscriptions is $P = 60 - Q$. Neither firm X nor firm Y has any fixed costs. The marginal cost of firm X is constant at \$10, and the marginal cost of firm Y is constant at \$20. Each firm can sell either 10 or 20 subscriptions, and they meet only once in this market.
    a. Show your calculations and create the payoff matrix. (6 分)
    b. Find the Nash equilibrium or equilibria. (7 分)
    c. If there are multiple equilibria, which equilibrium do you think is most likely to occur and why? (7 分)

備考	試題隨卷繳交

命題委員： （簽章） 年 月 日

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國立政治大學九十七 學年度研究所博碩士班入學考試命題紙

考試科目	經濟學	所別	4182 風管系，管理組	考試時間	3月16日 星期日 第1節

III. 在一古董拍賣會中，有貨真價實的「老」古董，也有乍看之下具有價值但實爲新品的「新」古董。假設老古董最低願意出售價格爲 20 萬元，新古董最低願意出售價格爲 15 萬元，而買方願意出價 25 萬元來購買老古董，18 萬元來購買新古董。若在今日之拍賣會中，共有約 80 件古董欲出售，試問老古董約至少有多少件（或佔多少比例），這些老古董的擁有者才會願意割愛？(15 分)

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	風管所管理組	考試時間	3月16日 星期日 第3節

(10%) 1. 試解下列名詞：

(1) 顯著水準 (level of significance)

(2) 最強力檢定 (most of significance)

(10%) 2. 設 $X_1, X_2, \cdots, X_n$ 爲抽取自常態分配 $N(\mu,\sigma^2)$ 的一組隨機樣本，S 爲樣本標準差。試寫出以下各個統計量所服從的抽樣分配

(a) $\bar{X}$ (b) $\dfrac{\bar{X}-\mu}{\sigma/\sqrt{n}}$ (c) $\dfrac{(n-1)S^2}{\sigma^2}$ (d) $\dfrac{\bar{X}-\mu}{S/\sqrt{n}}$ 。

(10%) 3. 一天內發生之電話撥號數服從母數爲 λ 之波氏分配，且各撥號爲互相獨立，其通話之長度服從母數爲 μ 之指數分配，試求一天內通話時間合計之 p.d.f.

(10%) 4. 某種機器之壽命服從指數分配時，試作其平均壽命 $\mu=\mu_0$ 之檢定方式。

(10%) 5. 設 X, Y 之 $J.p.d.f.$ 爲

$$f(x,y)=\begin{cases} cx^{\frac{m}{2}-1}\, y^{\frac{m+n}{2}-1}\, e^{-\frac{y}{2}(1+\frac{m}{n}x)} & (x>0, y>0) \\ 0 & \text{其他} \end{cases}$$

求 X 之 $p.d.f.$

(10%) 6. 設平面上一點 (X,Y) 在 $(-\frac{1}{2}\leqq X, Y\leqq\frac{1}{2})$ 內爲等分配，試求 $Z=XY$ 之 $p.d.f.$

(10%) 7. The lifetime of a printer costing 200 is exponentially distributed with mean 2 years.

The manufacturer agrees to pay a full refund to a buyer if the printer fails during the first year following its purchase, and a one-half refund if it fails during the second year.

If the manufacturer sells 100 printers, how much should it expect to pay in refunds?

備考	試題隨卷繳交

命題委員： （簽章） 97 年 3 月 6 日

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考試科目	統計學	所別	風險管理組	考試時間	3月16日 星期日 第3節

(10%) 8. The stock prices of two companies at the end of any given year are modeled with random variables X and Y that follow a distribution with joint density function

$$f(x,y)=\begin{cases}2x & \text{for } 0<x<1,\ x<y<x+1\\ 0 & \text{otherwise.}\end{cases}$$

What is the conditional variance of Y given that $X=x$?

(10%) 9. Let X_1, X_2, X_3 be a random sample from a discrete distribution with probability function

$$p(x)=\begin{cases}\frac{1}{3} & \text{for } x=0\\ \frac{2}{3} & \text{for } x=1\\ 0 & \text{otherwise}\end{cases}$$

Determine the moment generating function, $M(t)$, of $Y=X_1X_2X_3$.

(10%) 10. A device contains two circuits. The second circuit is a backup for the first, so the second is used only when the first has failed. The device fails when and only when the second circuit fails.

Let X and Y be the times at which the first and second circuits fail, respectively. X and Y have joint probability density function

$$f(x,y)=\begin{cases}6e^{-x}e^{-2y} & \text{for } 0<x<y<\infty\\ 0 & \text{otherwise.}\end{cases}$$

What is the expected time at which the device fails?

命題委員： （簽章） 97 年 3 月 6 日

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國立政治大學九十七 學年度研究所(碩)士班入學考試命題紙

考試科目	微積分	所別	4183 統計精算組	考試時間	3月16日 星期日 第1節

(10%) 1. 求函數 $u=\dfrac{x}{\sqrt{x^2+y^2+z^2}}$ 在點 $M(1,2,-2)$ 沿曲線 $x=t$, $y=2t^2$, $z=-2t^4$，在此點的切線方向上的導函數。

(10%) 2. 求下列曲線所界的面積：

$xy=a^2$, $x+y=\frac{5}{2}a$ $(a>0)$。

(10%) 3. $\lim\limits_{x\to\infty}\left(\dfrac{1-kx}{1+kx}\right)^x=5$，求 K 值。

(10%) 4. 討論 $\sum\limits_{k=1}^{\infty}\dfrac{2n-1}{2^n}$ 的斂散性。

(10%) 5. 求 $\int_0^1\left[\int_{2x}^{2} e^{y^2}dy\right]dx$ 之值.

(10%) 6. 求 $\int_0^2\int_{2x-4}^{0}\dfrac{2y-1}{x+1}\,dy\,dx$

備考	試題隨卷繳交

命題委員：　　（簽章）97 年 3 月 6 日

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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	微積分	所別	4183	考試時間	3 月 16 日 星期 日	第	節

(10%) 7. An insurance company has 120,000 to spend on the development and promotion of a new insurance policy for car owners. The company estimates that if x is spent on development and y is spent on promotion, then $\frac{x^{1/2}y^{3/2}}{400{,}000}$ policies will be sold. Based on this estimate, what is the maximum number of policies that the insurance company can sell?

(10%) 8. A virus is spreading through a population in a manner that can be modeled by the function

$$g(t)=\frac{A}{1+Be^{-t}}$$

where A is the total population, $g(t)$ is the number infected at time t, and B is a constant. What proportion of the population is infected when the virus is spreading the fastest?

(10%) 9. A company's value at time t is growing at a rate proportional to the difference between 20 and its value at t.

At $t=0$, the value is 2. At $t=1$, the value is 3.

Calculate the value at $t=3$.

(10%) 10. An ice cream vendor can sell 500 ice cream cones at a price of 2 per ice cream cone. For each 0.01 increase in the price per ice cream cone, the vendor will sell 5 fewer ice cream cones. For each 0.01 decrease in price, it will sell 5 more.

The vendor has fixed costs of 75 and variable costs of 0.10 per ice cream cone.

What price per ice cream cone should the vendor charge in order to maximize profit?

備考	試題隨卷繳交

命題委員： （簽章） 97 年 3 月 6 日

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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	國貿所精算組	考試時間	3月16日 星期四 第3節

1. Please explain the following items. (40%)

   (a) Efficiency, Completeness and Uniqueness, (15%)

   (b) The Likelihood Ratio Test, (10%)

   (c) The Bayes' Solution, (5%)

   (d) The Central Limit Theorem, (5%)

   (e) The Rao-Cramer Inequality. (5%)

2. Given $f(x;\theta)=1/\theta,^{*}\ 0<x<\theta$, zero elsewhere, with $\theta>0$, formally compute the reciprocal of $nE\left\{\left[\frac{\partial \ln f(X;\theta)}{\partial\theta}\right]^2\right\}$. Compare this with the variance of $(n+1)Y_n/n$, where Y_n is the largest item of a random sample of size *n* from this distribution. Comment on the findings. (10%)

3. If X_1, X_2 is a random sample of size 2 from a distribution having p.d.f. $f(x;\theta)=(1/\theta)e^{-x/\theta}$, $0<x<\infty$, $0<\theta<\infty$, zero elsewhere, find the joint p.d.f. of the sufficient statistic $Y_1=X_1+X_2$ for θ and $Y_2=X_2$. Show that Y_2 is an unbiased estimator of θ with variance θ^2. (10%)

4. Let X_1, X_2 be a random sample from the normal distribution N(0,1). Find the marginal p.d.f. of $Y_1=X_1/X_2$. (10%)

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	統計学	所別	風管所精算組	考試時間	3月16日 星期四 第3節

5. Let $Y_1 < Y_2 < Y_3$ be the order statistics of a random sample of size 3 from a distribution having the p.d.f. $f(x) = 2x$, $0 < x < 1$, zero elsewhere. Show that $Z_1 = Y_1/Y_2$, $Z_2 = Y_2/Y_3$, and $Z_3 = Y_3$ are mutually stochastically independent. (10%)

6. Let X have a p.d.f. of the form $f(x;\theta) = 1/\theta$, $0 < x < \theta$, zero elsewhere. Let $Y_1 < Y_2 < Y_3 < Y_4$ denote the order statistics of a random sample of size 4 from this distribution. Let the observed value of Y_4 be y_4. We reject H_0 : $\theta = 1$ and accept H_1 : $\theta \neq 1$ if either $y_4 \leq \frac{1}{2}$ or $y_4 \geq 1$. Find the power function of the test. (10%)

7. Let $\bar{X}_n$ denote the mean of a random sample of size n from a gamma distribution with parameters $\alpha = \mu > 0$ and $\beta = 1$. Find the limiting distribution of $\sqrt{n}(\bar{X}_n - \mu)/\sqrt{\bar{X}_n}$. (10%)

備考	試題隨卷繳交

命題委員： （簽章）108 年 3 月 7 日

命題紙使用說明：1.試題將用原件印製，敬請使用黑色墨水正楷書寫或打字（紅色不能製版請勿使用）。
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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	保險學	所別	風險管理與保險系 4187	考試時間	3月16日 星期日 第一節

1. 假設有兩個人面對一個相同損失 $1000 萬，其中一個人為低風險者，而另一位為高風險者，低風險者有 25% 之機率會遭受損失，高風險者有 75% 之機率遭受損失（40%）
   (a).請問何謂精算公平保費？請問此二人若要轉嫁風險其精算公平保費各是多少？
   (b).請說明保險公司所收的總保費是否就是精算公平保費，若否請說明原因？
   (c).請問保險公司如何區分被保險人誰是風險者、誰是風險者高？若無法區分，保險公司應如何定價才不會虧損？

2. 請就保險公司之經營管理，舉例分析目前台灣產險公司與壽險公司所面臨之最大問題為何？並請說明保險局及保險公司各應如何因應這些問題？(30%)

3. 何謂風險資本額（Risk-Based Capital）的制度？你認為此制度是否能比最低資本額限制對台灣保險公司清償能力之監理更有效？為什麼？並請舉例說明目前風險資本額制度實施上之重要問題與解決方案？（30%）

備考	試題隨卷繳交

命題委員： （簽章） 2008 年 3 月 7 日

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