

考試科目	保險法	系所別	風險管理與保險 學系法律組	考試時間	2月5日(五)第2節
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問答題：(每題二十五分)

一、近日媒體報導如下：「保單變更要小心！國稅局最近盯上要保人變更案件，正式行文壽險業者，明確要求保險業在受理變更保險契約要保人時，必須依照遺贈稅法規定，先通知當事人繳驗稽徵機關核發的證明書才能辦理。」

何謂「要保人變更」？變更時，保險契約的效力有無變動？壽險公司能否拒絕此類變更申請？試論述之。

二、某產險公司之保單條款約定如下：「被保險人於保險期間內，因飼養被保險水產之陸上養殖漁塢之溫度連續低於攝氏 10 度之時數逾九小時以上者，本公司依下列方式約定計算賠償金額，在保險金額之額度內，對被保險人負賠償之責。」

賠償金額 = 保險金額 X 賠付比例 X 投入成本累計比例 X (1 - 自負額比例)
 賠付比例 = $\text{Min} \left[1, \frac{\text{實際氣溫連續低於攝氏 10 度之持續小時數} - 9 \text{ 小時}}{\text{氣溫連續低於攝氏 10 度之持續 32 小時} - 9 \text{ 小時}} \right] \times 100\%$

此類定額給付型之保險商品，有無違反「損失填補原則」？試論述之。

三、人壽保險契約停效後，要保人於申請復效時，應具備何種要件？若是被保險人於復效時已罹患疾病，保險人能否拒絕？試說明之。

四、張三以自己為被保險人投保人壽保險。於投保時，張三故意隱匿其罹患癌症之事實。一年後，張三不幸因該癌症而病故。保險人能否主張解除保險契約而拒絕理賠？應向何人主張解除契約？試論述之。

備

註

- 一、作答於試題上者，不予計分。
- 二、試題請隨卷繳交。

考試科目	民法	系所別	風險管理與保險學系 法律組	考試時間	2 月 5 日(五) 第四節
<p>1. 甲為 A 土地之共有人之一且其應有部分為二分之一，某日乙廣告公司之員工丙見 A 土地位在精華地段適合作為廣告設置之用，遂代理乙與甲一人簽訂租賃契約，該租約載明「每月租金為 3 萬元，乙如需向政府機關申請設置廣告許可，甲應配合提出一切必要證明，若有違約情形，甲應賠償乙每月租金 50 倍之違約金」。然乙事後向甲請求交付 A 土地全體共有人出具之使用土地授權書與相關文件，以向政府機關申請設置廣告許可時，甲均以僅其個人出租 A 土地為由拒不提出授權書與相關文件，致乙無法向政府機關取得許可可以按期為客戶設置廣告，最終導致客戶解約，乙損失 200 萬元收益。乙得否依租賃契約向甲請求 50 倍之違約金（150 萬元）？除違約金以外，乙得否再對甲請求 200 萬元損害賠償？（25 分）</p> <p>2. 甲在乙保險公司之業務員丙招攬下，訂立意外保險契約。某日未成年人丁，在其父戊入睡後，駕駛戊之汽車外出購買宵夜，不慎與甲駕駛之汽車相撞，導致甲胸部嚴重挫傷、肋骨斷裂、氣胸。之後甲與丙聯絡理賠事宜時，卻因傷害等級未有共識而延宕。某次協商中，甲怒責丙「就是有你們這種人保險業形象才會這樣！」丙遂記恨在心，故意拖延理賠鑑定程序，導致甲無法及時取得理賠進行自費手術，傷勢加劇，肺部功能永久損傷，精神亦遭受極大痛苦。某日甲與丙再次就理賠問題協商，雙方一言不合，丙毆擊甲之頭部，殊不知甲之頭蓋骨先天較常人脆弱，甲因腦部受創而癱瘓。甲之父已親眼見到甲歷經理賠拖延與被毆，在精神上亦極為痛苦。據上事實，甲、已可否就財產上與非財產上損失，向丁、戊、乙、丙求償？（35 分）</p> <p>3. 何謂條件？請就其意義與類型申論之。（15 分）再者，保險法第 116 條規定：「保險契約終止時，保險費已付足二年以上，如有保單價值準備金者，保險人應返還其保單價值準備金。」據上，請分析以下敘述是否有理由：「要保人終止保險契約之解約金為附停止條件之債權，必於要保人行使終止保險契約之權利後，該停止條件始為成就，保險人始負有給付解約金之義務。」。（10 分）（以論述之完整度給分）</p> <p>4. 甲為賽犬訓練師，某日欲向飼料廠商乙購買飼料，遂通知乙先交付一個罐頭樣本，乙隨即交付雞肉罐頭一個供甲參考，甲目視後即向乙訂購罐頭一批。然交貨後，甲方發現乙交付之罐頭為一般之雞肉罐頭，其實欲購買犬隻為比賽所吃的精緻牛肉罐頭，遂拒絕給付價金。試問雙方法律關係為何？（15 分）</p>					
備註	<p>一、作答於試題上者，不予計分。 二、試題請隨卷繳交。</p>				

考試科目	保險學	系所別	國際管理與保險學 學法律組	考試時間	2月5日(五)第四節
<p>一、請說明「風險」、「損失」與「保險」三者的關係?(10%)並說明「保險」與「風險管理」間的關係。(10%)</p> <p>二、請說明何謂保險市場的「逆選擇」與「道德風險」?(15%)並說明保險人有哪些方法可以降低逆選擇與道德風險?(15%)</p> <p>三、請說明「損害填補原則」、「保險利益原則」、「保險代位原則」之內容?(15%)並說明三者之關聯?(10%)</p> <p>四、請說明產物保險公司與人壽保險公司經營上之異同?(15%)並簡要說明目前我國壽險業經營面臨哪些重要挑戰?(10%)</p>					
備註	<p>一、作答於試題上者，不予計分。</p> <p>二、試題請隨卷繳交。</p>				

考試科目	經濟學	系所別	國貿、企管 風管、科管	考試時間	2月5日(五)第二節
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Multiple Choice (1 point each)

Identify the letter of the choice that best completes the statement or answers the question.

- When a country allows trade and becomes an exporter of a good,
 - everyone in the country benefits.
 - everyone in the country loses.
 - the gains of the winners exceed the losses of the losers.
 - the losses of the losers exceed the gains of the winners.
- Inefficiency in monopolistically competitive markets can be identified with
 - their similarities to perfectly competitive markets.
 - not having the ideal number of firms in the industry.
 - a first-best equilibrium, where price is equal to marginal cost.
 - government programs that effectively regulate price.
- When a farmer is making a long-run decision of whether or not to exit an industry, the cost of land
 - will be considered as part of the farm's fixed cost.
 - is treated differently than the cost of machinery.
 - is not considered a sunk cost.
 - is irrelevant to the strategic decision.
- Economists compute the price elasticity of demand as
 - the percentage change in the price divided by the percentage change in quantity demanded.
 - the percentage change in the quantity demanded divided by the percentage change in price.
 - the change in quantity demanded divided by the change in the price.
 - the percentage change in the quantity demanded divided by the percentage change in income.
- Suppose you like banana cream pie made with vanilla pudding. Assuming all other things are constant, you notice that the price of bananas is higher. How would your demand for vanilla pudding be affected by this?
 - It would decrease.
 - It would increase.
 - It would be unaffected.
 - There is insufficient information given to answer the question.

備

註

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考試科目	經濟學	系所別	國貿、企管 風管、科管	考試時間	2月5日(五)第二節
<p>6. Jack's Hotdogs is a small street vendor business. The owner is trying to get a better understanding of his costs by categorizing them as fixed or variable. Which of the following costs are most likely to be considered fixed costs?</p> <p>A. the cost of ketchup B. the cost of hotdog buns C. wages paid to workers who sell hot dogs D. the cost of bookkeeping services</p> <p>7. After watching a movie, Alan chooses not to watch a second and goes for a walk instead. Economists could explain his choices using the concept of</p> <p>A. budget constraints. B. diminishing marginal utility. C. income effect. D. substitution effect.</p> <p>8. The tragedy of the commons is the</p> <p>A. undersupply of a public good due to people not wanting to pay for a publicly common good. B. disappearance of certain markets due to the lack of willingness to pay by individuals, leading to collective misfortune. C. depletion of a common resource due to individually rational but collectively inefficient over-consumption. D. notion that common resources are generally under consumed and therefore not produced by suppliers due to artificially low demand.</p> <p>9. The more firms there are in a market, the</p> <p>A. larger will be the price effect of one firm's output decision. B. smaller will be the price effect of one firm's output decision. C. more collusion is likely to happen. D. price effect must outweigh the output effect.</p> <p>10. Ethan enjoys buying books and going to the movies. He has income of \$150 to spend on these two goods each month. The price of a book is \$15 and the price of going to the movies is also \$15. He currently consumes four books and six movies a month. If the price of a book increases to \$20, then,</p> <p>A. the substitution and income effects would both predict Ethan would consume more of both goods.</p>					
備註	一、作答於試題上者，不予計分。 二、試題請隨卷繳交。				

考試科目	經濟學	系所別	國貿、企管 風管、科管	考試時間	2月5日(五)第二節
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B. the substitution and income effects would both predict Ethan would consume less of both goods.

C. the substitution effect would predict Ethan would consume more books and less movies, and the income effect would predict he would consume less of both.

D. the substitution effect would predict Ethan would consume less books and more movies and the income effect would predict he would consume less of both.

11. The rise of the price of imported goods

A. will directly affect GDP deflator.

B. will directly affect CPI.

C. will directly affect both GDP deflator and CPI.

D. will not directly affect both GDP deflator and CPI.

12. What is not a possible reason if a government prints money to stimulate the economy, but the unemployment rate keeps the same?

A. Nationals are fully rational.

B. There are no menu costs.

C. The money multiplier is greater than 1 but smaller than 2.

D. The short-run Phillips curve is a vertical line.

13. Country A only has 5 people. The current unemployment rate is 25%. Which statement of the followings is wrong?

A. There is no discourage worker.

B. One of them might be a full-time student.

C. Two of them have no jobs and are seeking for jobs.

D. There is one discouraged worker.

14. Which policy of the followings is not a possible solution for the rising housing prices?

A. Central banks sell government bonds through open market operations.

B. Central banks cut the discount rate.

C. Central banks raise the reserve requirements.

D. Central banks set a mortgage cap.

備註

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考試科目	經濟學	系所別	國貿、企管 風管、科管	考試時間	2月5日(五)第二節
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15. The marginal propensity of saving in Country A is 0.5. Currently, the country is suffered from COVID-19 and the government gives 3000 local dollars to every national. Suppose due to this policy, each national can help to increase money supply 2000 local dollars through the fractional-reserve banking system. What is the reserve ratio for Country A?

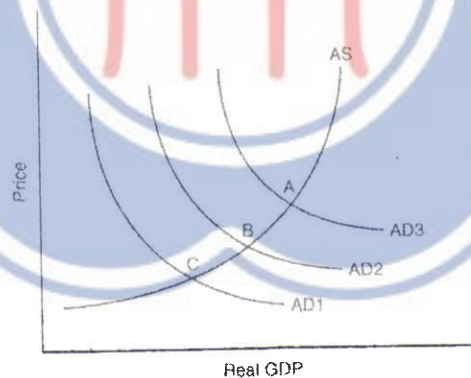
- A. 20%
- B. 30%
- C. 40%
- D. 50%

16. Stagflation occurs when

- A. real GDP increases and price levels decrease.
- B. real GDP decreases and price levels decrease.
- C. unemployment and price levels increase.
- D. nominal GDP decreases and price levels increase.

17. The multiplier effect will be greater on aggregate demand if

- A. there is no increase in the price level.
- B. both aggregate demand and aggregate supply increase.
- C. both aggregate demand and aggregate supply decrease.
- D. aggregate demand increases and aggregate supply decreases.



18. According to the preceding diagram, the economy is at equilibrium at Point A. Choose the best fiscal policy most appropriate to control demand-pull inflation.

- A. Decrease aggregate demand by increasing taxes.
- B. Increase aggregate demand by decreasing taxes.
- C. Decrease aggregate supply by increasing taxes.
- D. Increase aggregate demand by increasing government spending.

備註

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考試科目	經濟學	系所別	國貿、企管 風管、科管	考試時間	2月5日(五)第二節
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19. The crowding out effect may be avoided if
- the government pursues a contractionary fiscal policy.
 - the government destroys a percentage of the money supply.
 - the government issues new money.
 - A and C.
20. A disadvantage of a floating exchange rate is that
- trade may worsen due to a nation's depreciation of its currency.
 - tariffs cease to be effective.
 - exports decrease.
 - imports decrease.

Problems and Short-essay Questions

Please answer the following questions IN SEQUENCE. All questions may be answered in either Chinese or English.

1. Let the inverse demand function of good x in a country be $P_x = 5 - D_x$, where P_x is the price of x and D_x is the quantity demanded. The quantity supplied is Q_x and the inverse supply function is $P_x = 3 + Q_x$. Answer the following questions.
- (4 points) Derive the equilibrium price under autarky.
 - (8 points) Suppose the country is small. The price of x in the international market is 3. Will the country import or export x ? Calculate the quantity of export or import.
 - (8 points) Calculate the consumer and producer surplus under autarky and trade. Measure the gains from trade in terms of surplus.
2. The inverse market demand curve for a final good is $p = 100 - Q$ and the marginal cost of supplying labor is $MC_L = 40$. Each unit of output requires half unit of labor, L , and no other factor. That is, $Q = 2L$.
- (4 points) If the factor market is perfectly competitive and the output market is a monopoly, what are the equilibrium quantity and price in both factor and output markets?
 - (10 points) If both the factor and output markets are a monopoly, what are the equilibrium quantity and price in these two markets? How much profit does each firm make?
 - (6 points) Show that a vertical merger of the upstream and downstream monopoly increases profit and benefits consumers.

備

註

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考試科目	經濟學	系所別	國貿、企管 風管、科管	考試時間	2月5日(五)第二節
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3. Country A's Phillips curve can be written as:

$$u = u_{natural} = 0.5(\pi - x),$$

where u is the unemployment rate, u_n is the natural unemployment rate, and π is the current inflation rate. Please answer the following questions in detail.

A. (5 points) What does x stand for?

B. (5 points) Suppose Country A's structural unemployment rate is 3%, frictional unemployment rate is 2%, and cyclical unemployment rate is 1%. Please calculate the inflation rate, given x equals 1%.

C. (5 points) Following (B), suppose Country A announces to set an 3% inflation target in the coming year. Under the assumption of rational expectation and other things remaining the same, what will the current unemployment rate change?

D. (5 points) Following (C), suppose the government does not want to hurt the investment and the current nominal interest rate is 4%. What is the ideal nominal interest rate in the coming year?

4. Imagine an open economy in which Ricardian equivalence holds. This economy has a budget deficit of 50, a trade deficit of 20, and investment of 100.

A. (6 points) Define Ricardian equivalence.

B. (7 points) What is the level of private savings in this economy?

C. (7 points) If the budget deficit rises to 70, how are private savings affected?

備註

一、作答於試題上者，不予計分。
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考 試 科 目	統計學	系 所 別	風險管理與保險學系管理組	考 試 時 間	2 月 5 日(五)第 4 節
<p>1. Assume Y is a random variable that follows a Poisson distribution with a mean of t. The parameter t is itself a random variable that follows an exponential distribution with a mean of 1. Find $P\{Y = n\}$. (15%)</p> <p>2. Suppose that the score of a final exam come from a class with a mean score of 70 and a variance of 25. What is a diagnostically meaningful cutoff if you want to identify the students who score in the highest 5% of the class? ($z_{0.05} = 1.645$; $z_{0.025} = 1.96$; $z_{0.0099} = 2.33$) (10%)</p> <p>3. Suppose that T_1 and T_2 are random variables and have the joint density function given by</p> $f(t_1, t_2) = 2t_1, \quad 0 \leq t_1 \leq 1, \quad 0 \leq t_2 \leq 1$ $f(t_1, t_2) = 0, \quad \text{otherwise}$ <p>(1) Find $E(T_1 T_2)$. (10%)</p> <p>(2) Find $\text{Var}(T_1)$. (15%)</p> <p>4. The correlation coefficient between study hours and grades of 18 examinees is 0.6.</p> <p>(1) What percentage of the variation in grades can be explained by the study hours of the examinees? (10%)</p> <p>(2) Is there statistical evidence at the significance level of 0.05 to claim that study hours and grades are positively correlated? ($t_{20, 0.05} = 1.725$; $t_{20, 0.025} = 2.086$; $t_{18, 0.05} = 1.734$; $t_{18, 0.025} = 2.101$; $t_{16, 0.05} = 1.746$; $t_{16, 0.025} = 2.120$) (15%)</p> <p>5. Suppose that there are five identical bowls, which are labeled 1, 2, 3, 4 and 5. Bowl t contains t red and $5-t$ blue balls, with $t = 1, 2, 3, 4$ and 5. A bowl is randomly chosen and two balls are randomly selected without replacement from the contents of the bowl.</p> <p>(1) Find the probability that the two balls selected are both red? (10%)</p> <p>(2) Given that both balls selected are red, find the probability that bowl 3 was chosen? (15%)</p>					
備 註	<p>一、作答於試題上者，不予計分。</p> <p>二、試題請隨卷繳交。</p>				

考試科目	微積分	系所別	國際政治學系 精進班	考試時間	2月5日(五) 第2節
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Problem 1 (10 points)

Evaluate the iterated integral

$$\int_0^a \int_x^a \sin(y^2) dy dx, a > 0.$$

Problem 2 (15 points)

(a) Evaluate

$$\lim_{x \rightarrow 0} \frac{1 - \cos x}{x^2}.$$

(b) Evaluate

$$\lim_{n \rightarrow \infty} \frac{1 - \cos(\frac{1}{n})}{1 - \cos(\frac{1}{n+1})}.$$

(c) Find the interval of convergence of the power series

$$\sum_{n=1}^{\infty} (1 - \cos(\frac{1}{n})) x^n.$$

Problem 3 (10 points)

Use the method of Lagrange multipliers to find the extreme values of z on the curve of intersection of $x^2 + z^2 = 1$ and $y^2 + z^2 + z = 1$.

Problem 4 (10 points)

Determine whether the series converges absolutely, or converges conditionally, or diverges.

(a)

$$\sum_{n=1}^{\infty} (-1)^n \frac{3 \cdot 5 \cdot 7 \cdots (2n+1)}{n! \cdot 3^n}.$$

(b)

$$\sum_{n=1}^{\infty} \ln(1 + \frac{1}{\sqrt{n}}).$$

備

註

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考試科目	微積分	系所別	(1) 政治學系 經濟學組	考試時間	2 月 5 日 (二) 第 2 節
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Problem 5 (10 points)

Evaluate the integral

$$\int \frac{dt}{t - \sqrt{1-t^2}}$$

Problem 6 (10 points)

Evaluate the improper integral $\int_0^{\infty} x^n e^{-x} dx$, n is a positive number.

Problem 7 (15 points)

Consider the cardioid given by $r = 1 - \cos \theta$, $0 \leq \theta \leq 2\pi$.

- (a) Find the area enclosed by this curve.
- (b) Find the length of this curve.

Problem 8 (20 points)

Evaluate the limits.

(a)

$$\lim_{x \rightarrow \infty} \left(1 + \frac{3}{x} + \frac{5}{x^2}\right)^x.$$

(b)

$$\lim_{x \rightarrow 0} \frac{\int_{\cos x}^1 \frac{2}{t} dt - x^2}{x^4}.$$

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考試科目	統計學	系所別	風險管理與保險學系/精算科學組	考試時間	2 月 5 日(五) 第四節
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假設 $\Phi(\cdot)$ 是標準常態分配的累計分配函數。

1. (30%)

- 請陳述貝氏定理 (Bayes' Theorem)
- 某一族群中患有 Covid 19 的比例是五千分之一，ABC 試劑可以用來檢測某人是否患有 Covid 19 但非絕對正確。一個正常的人使用 ABC 試劑有萬分之一的機會產生錯誤的結論，一個患者 Covid 19 的人使用 ABC 試劑也有萬分之一的機會產生錯誤的結論。假設 A 君使用 ABC 試劑，而且檢驗結果為陽性，請問 A 君真的患有 Covid 19 的機率？

2. (40%) 假設 Z_1, Z_2 是獨立的標準常態隨機變數， $U = \Phi(Z_1)$ ， $X = -10 \log(\Phi(Z_2))$ ， $W = Z_1^2 + Z_2^2$ ， $Y = -\log(\Phi(Z_1)) - \log(\Phi(Z_2))$

- 請證明 U 為均勻隨機變數，並計算 U 的期望值與變異數。
- 請證明 X 為指數隨機變數，並計算 X 的期望值與變異數。
- 請證明 W 為卡方隨機變數，並計算 W 的期望值與變異數。
- 請證明 Y 為 Gamma 隨機變數，並計算 Y 的期望值與變異數。

3. (30%) $X = (X_1, X_2, X_3, X_4)$ 為多元標準常態隨機向量。

$$H = \begin{pmatrix} 1 & 1 & 1 & 1 \\ 1 & -1 & 1 & -1 \\ 1 & 1 & -1 & -1 \\ 1 & -1 & -1 & 1 \end{pmatrix}$$

- $Y = HX$ ，請問 Y 的共變異數矩陣為何？
- 計算 $\text{Var}(Y_1 + Y_2 + Y_3 + Y_4)$
- $Z = (Z_1, Z_2, \dots, Z_8)$ 為多元標準常態隨機向量。

$$G = \begin{pmatrix} H & H \\ H & -H \end{pmatrix}, \quad W = GZ. \quad \text{請問 } W \text{ 的共變異數矩陣為何?}$$

備

註

- 作答於試題上者，不予計分。
- 試題請隨卷繳交。