國立政治大學 105 學年度碩士班招生考試試題

考試科目	保險法 41812	所別	風管所	考試時間	2月27日(六)第1節

問答題：(每題二十五分)

一、某甲以其所有之自用汽車（市價為120萬元）向保險公司投保車體損失保險，保險金額為120萬元，自負額為20萬元。後來該車停在路邊時，被酒後駕車之某乙追撞至溪流之中，全車毀損且無法回復原狀。保險公司按全損方式給付甲保險金100萬元，之後對應負責之乙進行追償，所得金額為60萬元。該項追償所得應如何分配？試說明之。

二、保險法於2015年修訂後，保險業自2016年起開始適用「立即糾正措施」。依保險法之相關規定，試說明之。

三、2015年新北市八仙樂園發生大規模塵爆意外事故，人員傷亡與財產損失極為慘重。該事件可能涉及之保險種類為何？其保障之利益與對象有何差異？試說明之。

四、銀行為鼓勵使用信用卡，針對刷卡支付旅遊團費或機票費用之旅客，所提供免費之「飛航平安保險」。此時，其保險利益為何？該保險契約之當事人為何人？試說明之。

備註	一、作答於試題上者，不予計分。 二、試題請隨卷繳交。

國立政治大學 105 學年度碩士班招生考試試題

考試科目	民法（總則與債編總論） 41813	所別	風險管理與保險學系（法律組）	考試時間	2 月 27 日(六) 第三 節

一、人壽保險之被保險人甲於民國 96 年 4 月 29 日同因火災意外死亡。受益人乙為甲之子，於 96 年 5 月 2 日檢附申請理賠文件，依約請求 A 保險公司給付保險金。A 公司遲至 97 年 10 月 13 日始給付保險金 3470 萬元，但未給付遲延利息。乙於 100 年 1 月 18 日起訴請求給付自 96 年 5 月 18 日起至 97 年 10 月 13 日止之遲延利息 4,898,341 元。A 公司抗辯：系爭遲延利息請求權之消滅時效已完成，拒絕給付。試問雙方之主張何者有理由？請附理由說明之。(25 分)

二、甲向他人購買 A 屋，但因考慮到將來若欲參選總統時，名下財產過多可能招致對手攻擊，便以友人乙之名義辦理所有權移轉登記。嗣後乙因負債累累，遂將 A 屋出賣與知情之丙，並辦妥所有權移轉登記。試問：甲對乙、丙得主張何種權利？請附理由說明之。(25 分)

三、A 公司為精密電子儀器製造商，因欲前往美國將其新產品參與博覽會商展，委託 B 公司辦理空運事宜。然 B 公司將系爭儀器交由 C 公司運送至美國後，該儀器因倉庫管理不當而失竊。A 公司依民法債務不履行及侵權行為之規定，請求 B、C 公司連帶賠償儀器損失 200 萬元、博覽會場地租金 50 萬元、A 公司參展人員前往美國之住宿交通費 40 萬元、營業損失 1000 萬元。B、C 公司僅願賠償儀器損失，對 A 公司主張之其餘損失均拒絕賠償。試問：A、B、C 之主張何者有理？請附理由說明之。(25 分)

四、甲極為崇拜青春偶像藝人乙，某日甲向 A 保險公司投保人壽保險時，心血來潮，於要保書中將乙記載為受益人。二年後，甲因意外事故死亡，其子丙（為甲唯一的繼承人）向 A 公司請求給付保險金時，才發現自己並非受益人。乙得知上開情事後，遂向 A 公司表示不願享受保險金之利益。試問：何人享有保險金請求權？請附理由說明之。(25 分)

備註	一、作答於試題上者，不予計分。 二、試題請隨卷繳交。

4112、41212、4122A、41713、41822、41922、4194C、42112、42122

考試科目	經濟學	所別	商院共同科	考試時間	2月27日(六)第1節

Multiple Choice (1 point each)

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

1. Assume that the price elasticity of demand for good X is constant and equal to -0.5, and the price elasticity of demand for good Y is constant and equal to -2. Assume that goods X and Y have identical upward-sloping elastic supply curves. If a per-unit excise tax of the same amount is levied on good X and on good Y, which of the following would be true?

A. The percentage decrease in the quantity of good X demanded would be greater than the percentage decrease in the quantity of good Y demanded.

B. The tax share paid by consumers of good X would be relatively higher than that paid by consumers of good Y.

C. The tax share paid by consumers of good Y would be relatively higher than that paid by consumers of good X.

D. The tax share paid by sellers of good Y would be relatively lower than that paid by sellers of good X.

2. If the income elasticity of demand for good X is negative and the cross-price elasticity of demand between good X and good Y is negative, which of the following must be true of good X?

A. X is a normal good and is a substitute for Y.

B. X is a normal good and is a complement to Y.

C. X is an inferior good and is a substitute for Y.

D. X is an inferior good and is a complement to Y.

3. If an industry ignores the external costs it generates in its production, which of the following will be true at the competitive market equilibrium output?

A. Price will be greater than the marginal social cost.

B. Price will be less than the marginal social cost.

C. Price will be equal to the marginal social cost.

D. Marginal private cost will be greater than the marginal social cost.

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	所別	商院英國科	考試時間	2月27日(六)第1節

4. Karen works part-time at a local convenience store and earns $10 per hour. She wants to spend next Saturday afternoon attending a music concert. The full price of a concert ticket is $75, but Karen was able to get a discounted price of $50 from a friend who purchased the ticket but has become unable to attend. If Karen took 4 hours off from her job to attend the concert, what was her opportunity cost of attending the concert?

A. $40

B. $50

C. $90

D. $125

5. Which of the following is true of the substitution effect of an increase in the price of a normal good?

A. It works to offset the income effect.

B. It works to reinforce the income effect.

C. It is less than the income effect.

D. It causes an increase in the quantity demanded of the good.

6. A firm employs unskilled and skilled labor in a cost-minimizing mix at its manufacturing plant. The marginal product of unskilled labor is considerably lower than skilled labor. The equilibrium wage of the unskilled labor is only NT$90 per hour. The government passes a law that mandates a minimum wage of NT$120 per hour. Equilibrium wages for skilled workers exceed this minimum wage and therefore are not affected by the new law. The firm will most likely respond to the imposition of the minimum wage law by:

A. employing fewer skilled workers and allocate their salaries to unskilled workers.

B. keeping the mix of unskilled and skilled workers the same.

C. employing more unskilled workers at its plant.

D. employing fewer unskilled workers at its plant.

7. The short-term shutdown point of production for a firm operating under perfect competition will most likely occur when:

A. price is equal to average total cost.

B. marginal revenue is equal to marginal cost.

C. marginal revenue is less than average variable costs.

D. price is less than the marginal cost.

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	所別	商院共同科	考試時間	2月27日(六)第1節

8. Which of the following might cause a monopoly to exist?

I. Economies of scale

II. A single firm owning a key resource

III. A firm owning a patent on a product

IV. A firm being a price taker

V. Price discrimination

A. I, II, and III only.

B. II, III, and V only.

C. I, II and IV only.

D. II, III and V only.

9. Which of the following events could cause an increase in the production of labor?

I. Office workers receive faster computers.

II. Wages for textile workers rise.

III. More useful tools are given to a construction crew working on a house.

IV. The minimum wage law is enforced.

V. Bank clerks take a training course.

A. I and III only.

B. I, III and V only.

C. I, II, and IV only.

D. II, IV, and V only.

10. Companies most likely have a well-defined supply function when the market structure is

A. oligopoly.

B. monopoly.

C. perfect competition.

D. monopolistic competition.

11. Suppose that a country produces only two goods, x and y. In year 2012, the price of x is $P_x = 5$ and the production level is $Q_x = 5$. The price and production level of y are $P_y = 5$ and $Q_y = 5$. In year 2015, they are $P_x = 10$, $Q_x = 2.5$, $P_y = 10$, and $Q_y = 2.5$. If the base year is 2012, how the nominal and real GDP change between 2012 and 2015.

A. The nominal GDP does not change. The real GDP decreases.

B. The nominal GDP increases. The real GDP increases.

備註	一、作答於試題上者，不予計分。 二、試題請隨卷繳交。

C. The nominal GDP decreases. The real GDP decreases.

D. The nominal GDP does not change. The real GDP increases.

12. In the Keynesian model, the output is more sensitive to the change of money supply if

A. investment is more elastic to changes in interest rate.

B. the unemployment is high.

C. the country trades more with rest of the world.

D. the country has been operating on the production possibility frontier.

13. If the central bank purchases government bonds from the public,

A. supply of money increases.

B. interest rate increases.

C. the discount rate increases.

D. the price of bond decreases.

14. The natural rate of unemployment is the unemployment rate when the country

A. has zero growth rate.

B. has no inflation.

C. has only cyclical and structural unemployment.

D. operates on the production possibility frontier.

15. When the central bank increases the money supply, according to the short-run Philips curve, which of the following is true ?

A. Both the unemployment rate and the inflation rate will decrease.

B. Both the unemployment rate and the inflation rate will not change.

C. The unemployment rate will decrease but the inflation rate will increase.

D. Both the unemployment rate and the inflation rate will increase.

16. Which of the following will decrease U.S. net capital outflow?

A. capital flight from the United States

B. the government budget deficit increases

C. the U.S. imposes import quotas

D. None of the above is correct.

考試科目	經濟學	所別	商院英語科	考試時間	2月27日(六)第1節

17. An economic contraction caused by a shift in aggregate demand remedies itself over time as the expected price level

A. rises, shifting aggregate demand right.

B. rises, shifting aggregate demand left.

C. falls, shifting aggregate supply right.

D. falls, shifting aggregate supply left.

18. The term *crowding-out effect* refers to

A. the reduction in aggregate supply that results when a monetary expansion causes the interest rate to decrease.

B. the reduction in aggregate demand that results when a monetary expansion causes the interest rate to decrease.

C. the reduction in aggregate demand that results when a fiscal expansion causes the interest rate to increase.

D. the reduction in aggregate demand that results when a decrease in government spending or an increase in taxes causes the interest rate to increase.

19. Given a nominal interest rate of 20 percent, in which case would you earn the highest after-tax real interest rate?

A. Inflation is 5 percent; the tax rate on interest income is 20 percent.

B. Inflation is 4 percent; the tax rate on interest income is 30 percent.

C. Inflation is 3 percent; the tax rate on interest income is 40 percent.

D. The after-tax real interest rate is the same for all of the above.

20. If output is above its natural rate, then according to sticky-wage theory

A. workers and firms will strike bargains for higher wages. This increase in wages shifts the short-run aggregate supply curve right.

B. workers and firms will strike bargains for higher wages. This increase in wages shifts the short-run aggregate supply curve left.

C. workers and firms will strike bargains for lower wages. This decrease in wages shifts the short-run aggregate supply curve right.

D. workers and firms will strike bargains for lower wages. This decrease in wages shifts the short-run aggregate supply curve left.

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	所別	商院共同科	考試時間	2月27日(六)第1節

Problems and Short-essay Questions

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

1. Assume that sugar production in the U.S.A. was 15.6 billion pounds, and sugar consumption in the U.S.A. was 21.1 billion pounds in 1995. In the same year, price of sugar in the U.S.A. was 21.9 cents per pound, while the world price was 11.1 cents per pound.

a. (5 points) With a -0.3 price elasticity of demand, derive the demand function of the sugar in the U.S.A. in 1995. (Assume that the demand function of sugar is linear.)

b. (5 points) With a 1.5 price elasticity of supply, derive the supply function of the sugar in the U.S.A. in 1995. (Assume that the supply function of sugar is linear.)

c. (5 points) Compute the loss of consumer's surplus caused by the higher sugar price in the U.S.A.

d. (5 points) Compute the changes in producer's surplus caused by the higher sugar price in the U.S.A.

2. The processing of payroll for the workers of a major corporation can be done to varying degrees by clerks and computers. Suppose that we can represent the trade-offs between labor and capital by the following production function $Q = K^{3/4}L^{1/4}$. Q is measured in thousands of payment processed, K is measured in hours of processing time and L is measured in man-hours.

a. (5 points) Does the production function exhibit constant, increasing, or decreasing returns to scale? Please show your result with a simple demonstration or proof.

For the remainder of the question you may assume that the wage rate is NT$160 per man-hour and the rental rate of capital is NT$30 per hour.

b. (5 points) Given the prices of the inputs and the production function, find the compensated factor demands for labor and capital.

c. (5 points) What is the variable cost curve of the firm? If fixed costs are 100, then what is the total cost curve of the firm.

d. (5 points) Without calculating the derivative, are marginal costs constant, upward sloping, or downward sloping? Briefly explain your answer.

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	所別	商院共同科	考試時間	2月27日（六）第/節

3. Suppose in an economy, the autonomous consumption equals 100, the marginal propensity to consume equals 0.8, the net taxes are fixed at 100, the planned private-sector investment is fixed at 100, the government purchases are fixed at 100, and the net exports are fixed at 100. Answer the following questions.

a. (10 points) What is the equilibrium output in this economy?

b. (10 points) Suppose the government increases its expenditure to 200, which is financed by the fixed taxes. What is the equilibrium output in this economy?

4. In the summer of 1986 the *Economist* magazine conducted an extensive survey on the prices of Big Mac hambergers at McDonald's restaurants throughout the world. Since then it has periodically updated its calculations. The following table reproduces the results of the *Economist's* January 2015 survey report with slight modification to make the calculation easier.

Country	Price of a Big Mac	Predicted Exchange Rate	Actual Exchange Rate
Taiwan	80 NTD	______ NTD/USD	32 NTD/USD
Japan	360 JPY	______ JPY/USD	120 JPY/USD
USA	4.8 USD	1 USD/USD	1 USD/USD

a. (6 points) Suppose that purchasing power parity (PPP) holds. For Taiwan and Japan, compute the predicted exchange rate of local currency per U.S. dollar.

b. (4 points) According to PPP, what is the predicted exchange rate between the Japanese Yen and the New Taiwan Dollar? What is the actual exchange rate?

c. (4 points) Given the actual nominal exchange rate, what is the real exchange rate between Japan and Taiwan?

d. (6 points) Suppose that the actual exchange rate between Japan and Taiwan will converge to the PPP predicted exchange rate over the next ten years. Which of these two countries will experience a higher rate of inflation over this period? Which coutry will likely have a higher nominal interest rate? Why?

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	統計學 41823	所別	風險管理與保險學系精算組	考試時間	2月27日(六)第三節

1. (20%) Let r_i, for $i = 1, \ldots, n$, be independent samples of a random variable R of mean μ and variance σ^2. Define the estimate

$$\hat{\mu} = \frac{1}{n}\sum_{i=1}^{n} r_i$$

$$s^2 = \frac{1}{n}\sum_{i=1}^{n}(r_i - \hat{\mu})^2$$

Show that $E[s^2] = \sigma^2$.

2. (20%) Suppose a stock's rate of return has annual mean and variance of μ and σ^2. To estimate these quantities, we divide 1 year into n equal periods and record the return for each period. Let μ_n and σ_n^2 be the mean and variance for the rate of return for each period. In particular, assume that

$$\mu_n = \frac{\mu}{n} \ and \ \sigma_n^2 = \frac{\sigma^2}{n}$$

If $\hat{\mu}_n \ and \ \hat{\sigma}_n^2$ are estimates of these, then $\hat{\mu} = n\hat{\mu}_n \ and \ \hat{\sigma}^2 = n\hat{\sigma}_n^2$.

(A) Show that the standard deviation of $\hat{\mu}$ is independent of n

(B) Show how the standard deviation of $\hat{\sigma}^2$ depends on n

3. (20%) A coin having probability p of coming up heads is successively flipped until two of the most recent three flips are heads. Let N denote the number of flips. Find E[N]. Note that if the first two flips are heads, then N = 2.

4. (20%) Suppose that we continually roll a die until the sum of all throws exceeds 100. What is the most likely value of this total when you stop?

5. (20%) Suppose X is a Poisson random variable with mean λ. The parameter λ is itself a random variable whose distribution is exponential with mean 1. Compute the probability mass function P($X = n$)

備註	一、作答於試題上者，不予計分。 二、試題請隨卷繳交。

國立政治大學 105 學年度碩士班招生考試試題

考試科目	微積分 41832	所別	風險管理與保險學系/精算科學組	考試時間	2 月 27 日(六) 第 1 節

Please show all your work.

1. (10%) Suppose the point X is (2, 0). Find the points on $-x^2 + y^2 = 4$ that are closest to the point X.

2. (10%) Find the line that is tangent to the curve $y = (x^2+1)^{-1}$ at the point $\left(-1, \frac{1}{2}\right)$.

3. (10%) Evaluate $\int_0^t \frac{y\sin y}{1+\cos^2 y}\,dy$

4. (10%) Find the solution to $\frac{dy}{dx} = \frac{\sin x}{\sin y}$ that satisfies $y(0) = \frac{\pi}{2}$

5. (10%) Suppose point A is (6, 5, -2). What is the equation of the plane passing through point A and in the meanwhile parallel to the plane $x + y - z = -1$?

6. (10%) Find $\lim_{(x,y)\to(\pi,\pi)} x \sin\left(\frac{x+y}{4}\right)$

7. (10%) Evaluate $\int_0^{\pi}\int_0^{2}\int_0^{\sqrt{4-t^2}} t\sin y\,dx\,dt\,dy$

8. (10%) Find the gradient vector field of $f(x,y) = x^5 - 4x^2y^3$

9. (10%) Solve the differential equation $y' - 2xy = x$

10. (10%) Find the area of the region bounded by the following curves: $y = 2x$, $y = x^2 - 4x$

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	統計學 41833	所別	風管系精算組	考試時間	2月27日 週六 (下午) 第三節

2016 Mathematical Statistics Examination

1. (40%) Please explain the following items.
   (a) Sufficiency, Completeness and Stochastic Independence (8%)
   (b) Limiting distribution and Limiting Moment-generating function (8%)
   (c) Bayesian Estimates and Minimax Principle (8%)
   (d) Chebyshevs Inequality and the Rao-Cramer Inequality (8%)
   (e) The Uniformly Most Powerful Tests and Likelihood Ratio Tests (8%)

2. (15%) Given $f(x;\theta) = \frac{1}{\theta}, 0 < x < \theta$, zero elsewhere, with $\theta > 0$, formally compute the reciprocal of
$$100E\{[\frac{\partial ln f(x;\theta)}{\partial \theta}]^2\}.$$
Compare this with the variance of $\frac{101}{100}Y_{100}$ where Y_{100} is the largest item of a random sample of size $n = 100$ from this distribution.

3. (10%) Let the joint p.d.f. of X and Y be $f(x,y) = \frac{13}{7}x(x+y), 0 < x < 1, 0 < y < 1$, zero elsewhere. Let $U = min(X,Y)$ and $V = max(X,Y)$. Find the joint p.d.f. of U and V.

4. (10%) Let $X_1, X_2, \ldots, X_n$ be a random sample from the normal distribution $N(\theta, 100)$. Show the likelihood ratio principle for testing $H_0 : \theta = 10$ against $H_0 : \theta \neq 10$.

5. (10%) The Pareto distribution is used as a model in study of claim losses and has the distribution function
$$F(x;\theta_1,\theta_2) = 1 - (\frac{\theta_1}{x})^{\theta_2}, \theta_1 \leq x, zero\, elsewhere, where\, \theta_1 > 0\, and\, \theta_2 > 0.$$
If $X_1, X_2, \ldots, X_{100}$ is a random sample from this distribution, find the maximum likelihood estimators of θ_1 and θ_2.

6. (15%) Let $X \sim b(n,p)$ and $L(p, d(x)) = 2[p - d(x)]^2$. Let $\pi(p) = 1$ for $0 < p < 1$ be the prior pdf of p. Then find (a) the posterior pdf of p, (b) the Bayes estimate of p and (c) the Bayes risk.

備註	一、作答於試題上者，不予計分 二、試題請隨卷繳交。