問答題：（每題二十五分）

一、銀行與保險公司合作，由銀行發函推銷「信用卡保障計畫」，若銀行發行信用卡之持卡人付費加入該計畫，即可從保險公司獲得以下保障：「若持卡人發生身故、全殘、暫時失能或非自願性離職等事由，持卡人即可豁免信用卡帳單中該期之應付帳款總額。」試分析此商品是否為保險商品？其利益及權利主體為何？試分析之。

二、張三以其所有之汽車（市價為 200 萬元）向保險公司投保車體損失保險，約定保險金額為 200 萬元，自負額為 20 萬元。後來該車合法停在路邊，卻被酒後駕車之李四追撞落入山谷之中，全車毀損且無法回復原狀。保險公司依照全損方式給付張三保險金後對李四進行追償，所得金額為 100 萬元。試問保險公司為何能向李四追償？保險公司應否以追償所得填補張三之自負損失？試說明之。

三、依保險法之規定，訂立保險契約時，要保人負有「據實說明義務」，其立法理由為何？要保人如有違反時，其產生之法律效果為何？試說明之。

四、保險法第九十三條所規定「責任保險人之和解參與」，究為保險人之義務？抑或其權利？試論述之。

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一、甲因辦理土地登記之故,將自己之印鑑章及印鑑證明交付予土地代書乙。乙未經甲之同意,擅自以甲為保證人向丙借款,並蓋用甲之印鑑章。嗣後乙欠款未還,丙遂請求甲負保證之責,甲拒絕之。請問:甲是否須負保證人之責任?(25分)

二、甲某日駕車上班途中,因闖越紅燈,撞及行人某乙,致其傷重成為植物人,完全無法照顧自己之生活,須仰賴配偶丙及獨子丁之照顧。試問:乙、丙、丁得請求甲為如何之損害賠償?(25分)

三、甲於民國 83 年間,經由乙保險公司之業務員丙的招攬,與乙公司訂立人壽保險契約。丙嗣後離職,然仍繼續為甲提供保險服務,僅於向乙公司申辦保險契約事項時,均以亦受僱於乙公司擔任保險業務員之配偶丁的名義為之。期間丙多次將自甲收取之保險費侵占挪用,致甲受有損害。甲發現後,主張乙公司為業務員丙之僱用人,依民法第 188 條第 1 項前段之規定,訴請甲、乙負連帶賠償責任。乙公司則抗辯:丙於侵占保險費時已經離職為由,拒絕賠償丙於離職後所侵占之保險費。請問:乙之抗辯有無理由?(25分)

四、甲、乙訂立買賣契約,約定甲以 100 萬元之價格,向乙購買乙所有之 A 地。乙交付土地予甲後,尚未辦理所有權移轉登記之前,A 地經政府依法辦理徵收,乙並受領土地徵收補償金 130 萬元。請問:甲得否向乙請求其受領之徵收補償金?其依據及理由為何?(25分)

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Multiple Choice (1.7 points each)　　選擇題請在答案卡上作答，否則不予計分。

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

Mark each answer clearly with a No. 2 pencil on the Scantron form.

1. When a firm is operating at efficient scale, average total cost will
   (a) fall as output is increased.
   (b) fall as output is decreased.
   (c) be at its maximum.
   (d) none of the above.

2. If marginal cost exceeds marginal revenue, then
   (a) the firm must be experiencing losses.
   (b) the firm may still be earning a profit.
   (c) the firm is most likely to be at a profit maximizing level of output.
   (d) a profit maximizing firm should increase the level of production.

3. When a competitive market that is comprised of firms that have identical cost structures experiences a sudden yet persistent increase in demand, which of the following are most likely to happen?

   (i)　New firms will enter the market.

   (ii)　In the long-run all firms will be producing at their efficient scale.

   (iii)　The price will return to the level before the changes in demand in the long-run.

   (a) (i) and (ii) only
   (b) (i) and (iii) only
   (c) (ii) and (iii) only
   (d) (i), (ii) and (iii)

4. Excessive monopoly profits themselves represent
   (a) a deadweight loss.
   (b) a shrinkage in total surplus.
   (c) a shrinkage in consumer surplus.
   (d) all of the above.

5. Since natural monopolies have a declining average cost curve, regulating a natural monopoly by setting price equal to marginal cost would

(a) cause the monopolist to operate at a loss.

(b) maximize producer surplus.

(c) result in a less than optimal total surplus.

(d) achieve the optimal output level as in the competitive market in the long-run.

6. Consider the Chamberlin's monopolistic competition model. In the short-run equilibrium, the price of a firm must

(a) equal to the marginal cost

(b) equal to the marginal cost times the markup and be smaller than the average cost.

(c) equal to the marginal cost times the markup and be greater or equal to the average cost.

(d) be smaller than the marginal cost.

7. Suppose there are only two firms supplying in the market and they produce a homogeneous good. Two firms produce the good with the same constant marginal cost. There is no other cost of production. Firms compete by setting price simultaneously. Consumers maximize their utilities. The equilibrium price of both firms must

(a) equal to the marginal cost times the markup.

(b) equal to the marginal cost

(c) be greater than the marginal cost but smaller than the marginal cost times the markup.

(d) equal to the average cost.

8. Everything is the same as previous question, but one firm (firm A) has higher marginal cost than the other (firm B.) The equilibrium price must

(a) equal to the marginal cost of firm A

(b) equal to the marginal cost of firm B

(c) be slightly below the marginal cost of firm A or equal to the optimal price of firm B as it has the monopoly power.

(d) equal to the average cost of firm A.

9. Suppose in a country, there is a sector where producers produce a homogeneous good with an increasing constant marginal cost. There is a negative externality when producing the good. Suppose the country is a small open economy, which means it can import the good with a constant price. Suppose also that it does not have comparative advantage in producing the good and there is no complete specialization under free trade. In the following choices, what is the best policy to resolve the problem of externality?

(a) Using an import subsidy.

(b) Using a production subsidy.

(c) Using a tariff.

(d) Using a production tax.

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10. In a Ricardian trade model with two countries and two goods, suppose one country has absolute advantage in producing both goods. Goods are traded freely. The country with lower productivity must produce at least one good because
    (a) both countries enjoy gains from trade.
    (b) otherwise, the factor market cannot be clear.
    (c) two countries complete specialize in a sector at equilibrium.
    (d) both goods are demanded.

11. A simple linear demand function may be stated as $Q = a - bP + cI$ where Q is quantity demanded, P is the product price, and I is consumer income. To compute an appropriate value for c, we can use observed values for Q and I and then set the estimated income elasticity of demand equal to:
    (a) $c(I/Q)$
    (b) $c(Q/I)$
    (c) $-b(I/Q)$
    (d) $Q/(cI)$

12. Use the following two statements to answer this question:
    I. If utility is ordinal, a market basket that provides 30 utils provides twice the satisfaction of a market basket that provides 15 utils.
    II. When economists first studied utility it was believed that utility was cardinal, but it was later discovered that ordinal preferences are sufficient to explain how most individual decisions are made.
    (a) Both I and II are true.
    (b) I is true, and II is false.
    (c) I is false, and II is true.
    (d) Both I and II are false.

13. Which of the following demand functions represents a price elasticity of demand equal to -0.33 and an income elasticity of demand equal to 0.8 at all points along the curve?
    (a) $Q = 3 - 0.33P + 0.8I$
    (b) $Q = 4.5 - 0.33\log(P) + 0.8I$
    (c) $\log(Q) = 1.34 - 0.33\log(P) + 0.8I$
    (d) $\log(Q) = 2.34 - 0.33\log(P) + 0.8\log(I)$

14. Bob views apples and oranges as perfect substitutes in his consumption, and MRS = 1 for all combinations of the two goods in his indifference map. Suppose the price of apples is $2 per pound, the price of oranges is $3 per pound, and Bob's budget is $30 per week. What is Bob's utility maximizing choice between these two

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goods?
(a) 4 pounds of apples and 6 pounds of oranges
(b) 5 pounds of apples and 5 pounds of oranges
(c) 10 pounds of oranges and no apples
(d) 15 pounds of apples and no oranges

15. Assume that we have a demand curve of the form:

log(Q) = a - b log(P) + c log(I),

where Q = quantity, P = price, I = income, and a, b, and c are positive constants. The income and price elasticities for the demand curve represented above are always
(a) equal to one.
(b) equal to zero.
(c) equal (i.e., income elasticity always equals price elasticity).
(d) constant but not necessarily equal to one another.

16. Let P denote the price of goods in the Taiwan, P^W denote the price of goods in the foreign country, and E the exchange rate, measured as the number of units of foreign currency that can be purchased with one NTD. According to the law of one price,
(a) $P = EP^W$.
(b) $P^W = EP$.
(c) $E = P / P^W$.
(d) $P^W = E + P$.

17. Purchasing-power parity describes the forces that determine
(a) prices in the short run.
(b) prices in the long run.
(c) exchange rates in the short run.
(d) exchange rates in the long run.

18. If a McDonald's Big Mac cost $3.06 in the United States and 3.21 euros in the Euro area, then purchasing-power parity implies the nominal exchange rate is how many euros per dollar (approximately)?
(a) 1.05. If the value is less than this, it costs more dollars to buy a Big Mac in the U.S. than in the Euro area.
(b) 1.05. If the value is less than this, it costs fewer dollars to buy a Big Mac in the U.S. then in the Euro area.
(c) .95 If the value is less than this, it costs more dollars to buy a Big Mac in the U.S. than in the Euro area.
(d) .95 If the value is less than this, it costs fewer dollars to buy a Big Mac in the U.S. than in the Euro area.

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19. Which of the following does the level of real GDP measure?
    (a) total real income
    (b) productivity
    (c) the standard of living
    (d) All of the above are correct.

20. "When workers have a relatively small quantity of capital to use in producing goods and services, giving them an additional unit of capital increases their productivity by a relatively large amount." This statement
    (a) is an assertion that production functions have the property of constant returns to scale.
    (b) is consistent with the view that capital is subject to diminishing returns.
    (c) is inconsistent with the view that it is easier for a country to grow fast if it starts out relatively poor.
    (d) All of the above are correct.

21. If an unemployed person quits looking for work, then, other things the same, the unemployment rate
    (a) decreases and the labor-force participation rate is unaffected.
    (b) and the labor-force participation rate both decrease.
    (c) is unaffected and the labor-force participation rate decreases.
    (d) and the labor-force participation rate are both unaffected.

22. Suppose that efficiency wages become more common in the economy. Economists would predict that this would
    (a) increase the quantity demanded and decrease the quantity supplied of labor, thereby decreasing the natural rate of unemployment.
    (b) decrease the quantity demanded and increase the quantity supplied of labor, thereby increasing the natural rate of unemployment.
    (c) increase the quantity demanded and decrease the quantity supplied of labor, thereby increasing the natural rate of unemployment.
    (d) decrease the quantity demanded and increase the quantity supplied of labor, thereby decreasing the natural rate of unemployment.

23. An increase in the money supply
    (a) and an investment tax credit both cause aggregate demand to shift right.
    (b) and an investment tax credit both cause aggregate demand to shift left.
    (c) causes aggregate demand to shift right, while an investment tax credit causes aggregate demand to shift left.

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(d) causes aggregate demand to shift left, while an investment tax credit causes aggregate demand to shift right.

24. Sticky nominal wages can result in
    (a) lower profits for firms when the price level is lower than expected.
    (b) a decrease in real wages when the price level is lower than expected.
    (c) a short-run aggregate-supply curve that is vertical.
    (d) a long-run aggregate-supply curve that is upward-sloping.

25. Which of the following would cause prices and real GDP to rise in the short run?
    (a) an increase in the expected price level
    (b) an increase in the money supply
    (c) a decrease in the capital stock
    (d) None of the above is correct.

26. Which of the following monetary policy violates Taylor principle?
    (a) The central bank raises the federal funds rate from 1% to 2% when inflation goes from 2% to 2.5%.
    (b) The central bank raises the federal funds rate from 1% to 2% when output gap goes from 2% to 3%.
    (c) The central bank raises the federal funds rate from 1% to 2% when inflation goes from 2% to 3%.
    (d) The central bank raises the federal funds rate from 1% to 2% when output gap goes from 2% to 2.5%.

27. The M1 money multiplier will shrink due to
    (a) smaller excess reserves ratio.
    (b) smaller currency ratio.
    (c) greater time deposits ratio.
    (d) greater required reserves ratio.

28. A higher growth rate of money supply causes
    (a) lower interest rates if liquidity effect is larger than income and expected inflation effects.
    (b) higher interest rates if liquidity effect is larger than income and expected inflation effects.
    (c) lower interest rates if liquidity effect is smaller than income and expected inflation effects and the adjustment of expected inflation is slow.
    (d) lower interest rates if liquidity effect is smaller than income and expected inflation effects and the adjustment of expected inflation is fast.

29. Nowadays, most countries do not adopt monetary targeting since
    (a) the public do not understand how monetary targeting works.
    (b) the velocity of money is unstable and quite volatile.

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(c) the relationship of output and money aggregates is weak.

(d) inflation and money aggregates have inverse relationship.

30. Which of the following statements is true?

    (a) The conventional Phillips curve has microeconomic foundation.

    (b) The New Keynesian Phillips curve is merely a statistical relation.

    (c) The New Keynesian Phillips curve describes how current inflation depends on future expected inflation and unemployment.

    (d) The New Keynesian Phillips curve describes how current inflation depends on future expected inflation and real marginal cost.

Numerical/algebraic problems and short-essay questions

Please answer the following questions IN SEQUENCE. All questions may be answered in EITHER Chinese OR English.

1. A video game producer has costs of \$25,000 per month that are fixed with regard to output. The firm has a flat marginal cost at \$5 per unit of output for output between 1 and 16,000 units. The firm **cannot** produce more than 16,000 units. Information from the market research group indicates that the demand for the video game can be represented by the following $P = 9.8 - 0.0002Q$.

    (a) (3 points) What price should be set to maximize profit?　How many units of the game are sold?　What are the profits of the firm?

    The firm has the opportunity to sell in a second market that is separated from the first.　For the second market the market research group has estimated the demand relationship to be $P_2 = 7 - 0.0001Q_2$.

    (b) (5 points) The firm believes that this second market offers an opportunity for additional profit. Should it sell only units that would not be absorbed in the primary market at the profit-maximizing price or should it divert some units from the primary to the secondary market?　What price would you set in each market? What is the profit of the firm?

2. Suppose there is a country producing two goods with the following technology
$$Q_X = L_X$$
$$Q_y = K_y$$
Suppose that the labor supply is fixed at 50 units and the capital supply is fixed at 100 units. Consumers spend

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half of their income on good X and the rest of income on good Y. All markets are perfectly competitive. Let good Y be the numeraire. Answer the following questions

(a) (3 points) Derive the equilibrium price of X relative to Y.

(b) (3 points) Suppose there is another country producing two goods with the same technology and consumers in that country also evenly spend their income on both goods. In this country, the supply of labor is fixed at 100 units and the supply of capital is fixed at 50 units. Derive the equilibrium price of X relative to Y if two countries trade freely.

(c) (3 points) What is the good the capital abundant country exports? How many quantities of that good does it export?

3. Chester lives in a dormitory that offers soft drinks and chips for sale in vending machines. His utility function is U = 3SC (where S is the number of soft drinks per week and C the number of bags of chips per week), so his marginal utility of S is 3C and his marginal utility of C is 3S. Soft drinks are priced at $0.50 each, chips $0.25 per bag.

(a) (3 points) Write an expression for Chester's marginal rate of substitution between soft drinks and chips.

(b) (3 points) Use the expression generated in part (a) to determine Chester's optimal mix of soft drinks and chips.

(c) (2 points) If Chester has $5.00 per week to spend on chips and soft drinks, how many of each should he purchase per week?

4. To catch up with the living standard of the US,

(a) (4 points) Can a sufficiently poorer country achieve this goal by simply receiving more capital donated by the United Nation on a per-capita basis? Why or why not?

(b) (4 points) Can a sufficiently poorer country achieve this goal by simply increase her saving rate? Why or why not?

5. Use the model of aggregate demand and aggregate supply to illustrate each of the following event's short-run and long-run impacts on the aggregate price level and aggregate output.

(a) (4 points) There is an increase in households' wealth due a stock market boom.

(b) (4 points) The government lowers taxes, leaving households with more disposable income, with no corresponding reduction in government spending.

6. Consider a model that the central bank may have incentives to deviate from a monetary policy rule. The central bank's objective is to maximize the expected value of

$$U = \lambda(y - y_n) - \frac{1}{2}\pi^2,$$

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where y is output, y_n is the economy's natural rate of output, π is inflation rate, and $\lambda > 0$. The aggregate output is given by a Lucas-type supply function:

$$y = y_n + a(\pi - \pi^e) + e,$$

where π^e is expected inflation, e is a supply shock ($e \sim N(0, \sigma_e^2)$), and $a > 0$. The link between inflation and the monetary policy instrument is given by

$$\pi = \Delta m + v,$$

where Δm is the growth rate of money and v is a velocity disturbance ($v \sim N(0, \sigma_v^2)$). We assume that the central bank can observe π^e and the realization of e but not the realization of v before its choice of Δm. We also assume that two disturbances e and v are uncorrelated.

(a) (4 points) What is the central bank's optimal choice of　Δm?

(b) (4 points) Compared to the case that the central bank commits to a rule $\Delta m = 0$, which policy makes the society better off (i.e. higher expected utility)? Show all your work.

1. (20%) Suppose that continuous random variables X and Y have first moments. Please prove $E(Y) - E(X) = \int_{-\infty}^{\infty}[P(X < t < Y) - P(Y < t < X)]dt$.

2. Let $X|P \sim \text{binomial}(n, P)$ and $P \sim \text{beta}(\alpha, \beta)$.
   a. (5%) Calculate the marginal density of X.
   b. (5%) Calculate the expected value of X.
   c. (5%) Calculate the variance of X.
   Note: The probability distribution of a binomial distribution $f(x) = \binom{n}{x}p^x(1-p)^{n-x}, x = 0,1,2,\ldots$

   The probability density of a beta distribution $f(y) = \frac{\Gamma(\alpha+\beta)}{\Gamma(\alpha)\Gamma(\beta)}y^{\alpha-1}(1-y)^{\beta-1}, 0 < y < 1$.

3. Let X_1, X_2 be a random sample from uniform distribution $U(\theta, \theta + 1)$. To test hypotheses $H_0: \theta = 0$ versus $H_1: \theta > 0$, we have two competing tests:
   $$\phi_1(X_1): \text{Reject } H_0 \text{ if } X_1 > 0.98,$$
   $$\phi_2(X_1): \text{Reject } H_0 \text{ if } X_1 + X_2 > C$$
   (a) (5%) Find the value C so that ϕ_2 has the same size as ϕ_1.
   (b) (10%) Calculate the power function of each test.
   (c) (15%) Prove or disprove: ϕ_2 is uniformly more powerful than ϕ_1.

4. (10%) Let $\overline{X_n}$ denote the mean of a random sample of size n from normal distribution $N(\mu, 1)$. Find the limiting distribution of $\overline{X_n}$.

5. (10%) Let random variables X and Y be uniformly distributed on the triangle $0 < x < y < 1$. Let $U = X/Y$. Please find the probability density of U.

6. Let random variables X_1, X_2, and X_3 have moment-generating function (m.g.f.) $M(t_1, t_2, t_3) = (1 - t_1 + 2t_2)^{-4}(1 - t_1 + 3t_3)^{-3}(1 - t_1)^{-2}$.
   (a) (5%) Find the covariance of X_1 and X_2.
   (b) (5%) Find the joint m.g.f. of $U = X_1 + X_2 + X_3$ and $V = 2X_1 - X_2 + 4$.
   (c) (5%) Are U and V independent?

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1. (20 分) 若 $f(x) = 100e^{5x}$

   請計算下列微分:

   　　甲、$f'(1)$

   　　乙、$f''(0)$

2. (20 分) 若 $g(t) = \sin(3t)\cos(2t)$

   請計算下列微分

   　　甲、$g'(0)$

   　　乙、$g''(0)$

3. (30 分) 若 n 為正整數, 且 $i^2 = -1$, $w = e^{2\pi i/n}$

   請計算下列級數合

   　　甲、$\sum_{k=0}^{n-1} w^k$

   　　乙、$\sum_{k=0}^{n-1} w^{2k}$

   　　丙、$\sum_{k=0}^{n-1} w^{3k}$

4. (30 分) 若 λ、θ 為實數, $\lambda > \theta \geq 0$, 且 $f(t) = \lambda e^{-\lambda t}$, $M(\theta) = \int_0^{\infty} e^{\theta t} f(t)dt$

   請計算下列函數的值

   　　甲、$M(0)$

   　　乙、$M''(0)$

   　　丙、$\left(\int_x^{\infty} f(t)dt\right)\left(\int_y^{\infty} f(t)dt\right)$, 其中 x, y 為任意正實數。

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1. Please explain the following items.

(a) Chebyshev's Inequality and its proof. (10%)

(b) Factorization Theorem and Rao-Blackwell Theorem (10%)

(c) Decision function, Loss function, Risk function and Bayes's solution in Bayesian methods (10%)

(d) Neyman-Pearson Lemma, the Uniformly Most Powerful Tests and Likelihood Ratio Tests (15%)

2. (10%)

Let X_1 and X_2 have the joint p.d.f. $F(x_1, x_2) = 8x_1x_2$, $0 < x_1 < x_2 < 1$. Find the joint p.d.f. of $Y_1 = X_1 / X_2$ and $Y_2 = X_2$ and the marginal p.d.f. of Y_1.

3. (10%)

Let X have the p.d.f.

$$F(x) = \frac{1}{\pi}, \quad \frac{-\pi}{2} < x < \frac{\pi}{2}.$$

Find the distribution of $Y = \tan X$.

4. (15%)

Let $X_1, X_2, ..., X_{10}$ be a random sample of size 10 from a Poisson distribution with mean μ. (1) Show that a uniformly most powerful critical region for testing $H_0: \mu = 0.5$ against $H_1: \mu > 0.5$. (2) What is a uniformlty most powerful critical region of size $\alpha = 0.068$? (3) Sketch the power function of this test.

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5. (10%)

Let Y_n denote the second order statistic of a random sample from a distribution of the continuous type that has distribution function $F(x)$ and p.d.f. $f(x) = F'(x)$. Find the limiting distribution of

$$Z_n = n[1 - F(Y_n)].$$

6. (10%)

Let $X_1, X_2, \ldots, X_n$ be a random sample from $Poisson(\lambda)$. For estimating λ, using the quadratic error loss function, prior distribution over Θ, given by p.d.f.

$$\pi(\lambda) = e^{-\lambda} \quad if \ \lambda > 0,$$
$$= 0 \quad otherwise,$$

is used. Find the Bayes estimate for λ.