

考試科目	保險法	系所別	風管系法律組	考試時間	2 月 6 日(二) 第二節
<p>一、甲擁有汽車一輛，除依法投保強制汽車責任保險之外，並與 A 產物保險公司訂立任意汽車第三人責任保險契約，約定保險金額為 300 萬元。某日甲駕駛該汽車外出，不慎撞及行人乙成傷。乙訴請甲負賠償責任，經一審法院判決甲應賠償 220 萬元。於上訴程序中，乙提出新台幣 250 萬元之要約，甲原欲同意該和解金額，但通知 A 公司參與後，A 公司表示不同意 250 萬元之和解金額，認為如甲、乙以該金額和解，該公司僅願於 220 萬元範圍內支付保險金。甲、乙間因之和解不成立。兩造續行訴訟後，法院最終判決甲應賠償乙 330 萬元及遲延利息確定。嗣後 A 公司僅願在保險金額範圍內支付 300 萬元之保險金。甲甚感不服，另行訴請 A 公司賠償甲所額外負擔之賠償責任 30 萬元、遲延利息 50 萬元、訴訟費用 12 萬元及第三審律師費 8 萬元。A 公司抗辯其所負責任以保險金額為上限而拒絕之。何者之主張為有理由？(25 分)</p> <p>二、甲以其配偶乙為被保險人，與 A 保險公司訂立人壽保險契約，約定保險金額為新臺幣 600 萬元，並指定其獨生女丙為受益人。數年後，甲因駕車撞傷行人丁，經法院判決應向丁賠償 50 萬元確定，然甲始終不願履行賠償責任。丁便聲請法院強制執行。A 公司收受執行法院函詢後，向法院陳報該保險契約如於當時終止，將有解約金 120 萬元。法院依丁之聲請，向 A 公司發扣押命令，載明於 50 萬元及遲延利息之範圍內，扣押甲當時對於 A 保險公司基於該人壽保險契約之解約金、保險金及保單價值準備金等一切權利，並禁止 A 公司向甲清償。三日之後，乙發生車禍不幸死亡。丙本於受益人地位，向 A 公司請求給付保險金 600 萬元。A 公司以該契約上之權利業經法院扣押為由，拒絕給付。請附理由說明：何者之主張較有理由？(25 分)</p> <p>三、何謂複保險？何謂保險競合？請申論其內涵與差異。試闡述我國法規下，每人可購買之實支實付醫療保險之現況與妥適性，並分析是否符合損失填補原則？(25%)</p> <p>四、A 為倉庫業者，與雜貨業者 B 訂有倉庫契約，B 定期將貨品儲存與倉庫。A 並與 C 產險公司長年訂有火災保險。某日，因 B 疑似因過失不當堆疊可燃貨物導致大火，使得倉庫嚴重受損。雖然火災起因與理賠範圍有爭議，但顧及兩者長年商誼，C 乃與 A 進行和解，約定解除保險契約，但給付與保險理賠相同之金額，作為保費之退還與解約之損害賠償。A 取得該和解金後，又依據債務不履行與侵權行為等規定，向 B 求償。請依據保險法理分析上述事實。(25%)</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	公司法	系所別	風管所法律組	考試時間	2月6日(二)第4節
<p>1. 何謂「揭穿公司面紗」？何謂「反向揭穿公司面紗」？試說明、舉例、並分析對我國法之啟示。(25%)</p> <p>2. 公司法第 193-1 條規定：「公司得於董事任期內就其執行業務範圍依法應負之賠償責任投保責任保險。公司為董事投保責任保險或續保後，應將其責任保險之投保金額、承保範圍及保險費率等重要內容，提最近一次董事會報告。」又臺灣證券交易所股份有限公司上市公司董事會設置及行使職權應遵循事項要點第 16 條規定：「上市公司應為全體董事、監察人於其任期內就執行業務範圍依法應負之賠償責任購買責任保險。」試分析上述規定之利弊得失。(25%)</p> <p>3. 試說明公司法第 172-1 條股東提案權之要件。A 與 B 為公開發行股票之甲公司股東兼任董事，各持有已發發表決權股 10% 與 8%。C 則持有該公司 5% 之無表決權股。在某次董事會決議，在董事 D 與 E 主導下，經 7 分鐘討論後，決議將公司實收股本 50% 之資金投資於其等之好友乙之公司。A、B 與 C 對此甚為不滿。A 認為 D 與 E 之作為違法，故於股東會召集前提案請求訴追兩者之責任。B 則提案要求公司應增加盈餘分派。C 則提案應儘速召集股東臨時會以修改公司章程。試分析前述之三個提案是否妥當？(25%)</p> <p>4. 甲股份有限公司主要以生物科技為主要業務，擁有製作疫苗之設備。疫情過後，公司業務受到嚴重影響。A 董事認為公司應該繼續開發其他疫苗，B 董事則認為應該轉往醫療美容器材等方向。兩人爭執不下，董事長 C 不堪其擾，遂決定自行召開股東臨時會，將此議案由股東公決。並隨即發出會議通知，訂明於一週後開會。在股東臨時會中，以普通決議決定不再發展疫苗，C 乃自行將製作疫苗之設備悉數轉讓予 D 公司。試依據公司法理分析上述事實。(25%)</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	保險學	系所別	國際管理與保險學	考試時間	2 月 6 日(二) 第四節
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一、何謂「損害填補原則」？我國健康保險保單中，常見的類型有所謂「實支實付」與「日額型」保單，請問這兩種保單與「損害填補原則」的適用上有何關聯性？(20%)

二、何謂「保險利益」？實務上有人認為人壽保險只要訂約時存在保險利益即可，而在保險事故發生時，可以不需要有保險利益的存在；而財產保險則剛好相反，認為訂約時並不一定要有保險利益的存在，但在保險事故發生時一定要有保險利益的存在才會理賠。請問這樣說法的理由是什麼？(25%)

三、何謂人壽保險契約中常見的「自殺條款」？理論上故意行為所致保險事故，保險人是可以不予理賠的。但為何會有「自殺條款」的存在。20%

四、解釋名詞 35%

1. 弱體保單
2. 合約服務邊際(CSM)
3. morale hazard
4. Deductible
5. Incurred-but-not-reported reserve(IBNR)
6. Speculative risk
7. Subrogation

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	商學院共同科	考試時間	3月6日(二)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.

- A consumer's utility function is  $U(x, y, z) = 5y + \min\{x, 2z\}$ . Now, at  $p_x = 1, p_y = 5$ , and  $p_z = 2$ , which of the following descriptions is correct as  $p_z$  marginally decreases.
  - The income effect increases the consumption of  $y$ .
  - There is no substitution effect.
  - There is no income effect.
  - The substitution effect increases the consumption of  $z$ .
- Suppose a consumer with a monotonic preference consumes only two goods. Then,
  - both goods need to be normal goods.
  - two goods are substitutes for each other.
  - if she has a downward sloping demand on one good, so as on another good.
  - None of the above is correct.
- Ann's preferences can be represented by the utility function  $U(x, y) = (x - 3)^2 + (y - 4)^2$ , then which of following is correct?
  - Her preference is convex.
  - Her preference is monotonic.
  - Commodity  $x$  is a "bad" for Ann.
  - If Ann has 10 dollars and  $p_x = p_y = 1$ , then Ann will consume  $x = y = 5$ .
- Consider a monopolistic competition market with a limited number of licenses that can be traded. In the long run, which of the following statements is incorrect?
  - All firms in the market earn zero profit.
  - Some firms have incentives to sell their licenses.
  - The potential entry firms will be indifferent between entering the market or not.
  - All firms produce at a quantity with decreasing average cost.
- Consider a market with demand,  $Q_D = 200 - 5P$  and supply,  $Q_S = 5P - 75$ . The production process causes pollution for the environment as a negative external cost per unit is represented as  $E_C = Q_S/5 + 10$ . If the government plans to levy a Pigouvian ad valorem tax, which of the following is the correct tax rate?
  - 45%
  - 66%
  - 75%
  - 100%

備

註

- 作答於試題上者，不予計分。
- 試題請隨卷繳交。

考試科目

經濟學

系所別

商學院共同科

考試時間

2 月 6 日(二) 第二節

6. What is the producer surplus of the monopoly when it conducts perfect price discrimination, given the demand function and marginal cost as  $Q = 10 - P$  and  $MC = 5$ , respectively?

- A. 3.125
- B. 6.25
- C. 12.5
- D. 25

7. Among the following total cost functions of firms in a perfectly competitive market, which one has a meaningful shutdown point ( $Q_{shutdown} > 0$ )?

- A.  $5Q^3 + 20Q^2 + 50Q + 100$
- B.  $5Q^3 - 20Q^2 + 50Q + 100$
- C.  $5Q^3 + 20Q^2 + 50Q - 400$
- D.  $5Q^3 + 2Q^2 - 100Q + 100$

8. The long-run total cost function of a firm in a monopolistic competitive market is  $TC(Q) = 7700Q - 100Q^2 + 1/3Q^3$ . Which of the following represents a possible long-run equilibrium price and output?

- A.  $(P, Q) = (100, 100)$
- B.  $(P, Q) = (200, 150)$
- C.  $(P, Q) = (500, 120)$
- D.  $(P, Q) = (500, 180)$

9.

		Player 2		
		A	B	C
Player 1	A	(1,2)	(2,1)	(1,0)
	B	(0,5)	(1,2)	(7,4)
	C	(-1,1)	(3,X)	(2,2)

Which of the following values of  $X$  yields the above game exactly two pure strategy Nash equilibria?

- A. 0
- B. 1
- C. 1.5
- D. 3

10. Suppose a market has the following well-defined market supply curve:  $Q = P + 3$ . The market structure of this market could be:

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	商學院共同科	考試時間	2月6日(二)第二節
<p>(i) Perfect competition.  (ii) Monopolistic competition.  (iii) Monopoly.  (iv) Oligopoly.  A. (i) only  B. (ii) and (iii)  C. (ii), (iii), and (iv)  D. (i), (ii), (iii), and (iv)</p> <p>11. Suppose Iran has a comparative advantage over other countries in producing pistachios, but other countries have an absolute advantage over Iran in producing pistachios. If trade in pistachios is allowed, Iran  A. will import pistachios.  B. will export pistachios.  C. will have nothing to gain either from exporting or importing pistachios.  D. will either import or export pistachios, but it is not clear from the given information.</p> <p>12. In the United States, the CPI was 100 in 1983 and is 250 in 2018, then \$100 in 2018 purchases the same amount of goods and services as  A. \$25 purchased in 1983.  B. \$40 purchased in 1983.  C. \$100 purchased in 1983.  D. \$250 purchased in 1983.</p> <p>13. Seeing a looming credit crunch, banks choose to hold more excess reserves relative to their deposits. This action  A. does not change the money multiplier, but increase the money supply.  B. does not change the money multiplier, but decrease the money supply.  C. increases the money multiplier, and increase the money supply.  D. decreases the money multiplier, and decrease the money supply.</p> <p>14. Suppose the inflation rate is high, but unemployment is at its natural rate. If the central bank pursues a contractionary monetary policy, which of the following results would be expected in the short run?  A. The short-run Phillips curve would shift to the left.  B. The short-run Phillips curve would shift to the right.  C. The economy would move up and to the left along a given short-run Phillips curve.  D. The economy would move down and to the right along a given short-run Phillips curve.</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	商學院共同科	考試時間	2月6日(二)第二節
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15. Which of the following would transfer wealth from old to young?
- Increases in the budget deficit
  - Increases in housing prices
  - More generous education subsidies
  - Indexation of Social Security benefits to inflation
16. Which of the following results in higher inflation and higher unemployment in the short run?
- The Fed institutes an interest rate cut.
  - The Fed raises interest rates.
  - The price of oil increases.
  - All of the above.
17. Other things being equal, as the price level of a country increases,
- its real value of money falls and its currency appreciates.
  - its real value of money rises and its currency appreciates.
  - its real value of money falls and its currency depreciates.
  - its real value of money rises and its currency depreciates.
18. Which of the following shifts both the long-run aggregate supply curve and the short-run aggregate supply curve?
- a change in the price level
  - a change in the money wage rate
  - an advance in technology
  - All of the above.
19. If the price level is constant and the slope of the aggregate expenditure curve in the Keynesian model is 0.75, a decrease in investment of \$100 leads to a(n) \_\_\_\_\_ in real GDP of \_\_\_\_\_.
- decrease; \$75.
  - increase; \$75.
  - increase; \$400.
  - decrease; \$400.
20. Suppose the economy is experiencing an unanticipated event. Real borrowing costs rise for debtors due to the occurrence of this event. What kind of event might it be and what kind of action could the Fed take to help the debtors?
- An unexpected fall in price; increase the money supply.
  - An unexpected fall in price; decrease the money supply.
  - An unexpected rise in price; decrease the money supply.
  - An unexpected rise in price; increase the money supply.

備

註

- 作答於試題上者，不予計分。
- 試題請隨卷繳交。

考試科目

經濟學

系所別

商學院共同科

考試時間

2月6日(二)第二節

### Problems and Short-essay Questions

1. David consumes two goods: pencils ( $x_1$ ) and erasers ( $x_2$ ). The price of a pencil is  $P_1$  while the price for an eraser is  $P_2$ . David has  $m$  dollars. David's utility function is

$$u(x_1, x_2) = \min\{6x_1 + x_2, x_1 + 2x_2\}.$$

- (7 points) Calculate the marginal rate of substitution ( $\frac{dx_2}{dx_1}$ ) for David.
- (7 points) What are David's demand functions in terms of  $P_1$ ,  $P_2$ , and  $m$ .
- (6 points) Suppose  $P_1 = 2$ ,  $P_2 = 4$ , and  $m = 40$ . Moreover, if one buys 10 pencils or more, he will get 5 erasers for free. What is David's optimal choice now?

2. A perfectly competitive market in a small country has 50 identical firms. Suppose the market demand function is  $P = 130 - Q$  and the supply curve of a firm is  $P = -50 + 50q$ , where  $P$  is the market price,  $Q$  is the market quantity supplied, and  $q$  is a firm's quantity supplied. Please answer the following questions in detail:

- (5 points) What is the market supply curve?
- (5 points) What is the market equilibrium under autarky?
- (10 points) Suppose the world price of the market product is 30, and the small country is currently under free trade. What level of import tariff should the government impose to make consumer surplus equal to 4512.5?

3. Below are some data from the land of milk and honey.

Year	Price of Milk	Quantity of Milk	Price of Honey	Quantity of Honey
2020	7	10	2	15
2021	5	17	5	3
2022	4	30	6	6

- (6 points) Compute the percentage change in nominal GDP between 2020 and 2022.
- (8 points) Suppose the government adopts the fixed-based approach to measure the real GDP by setting 2020 as the base year. What is the cumulative real GDP growth rate between 2020 and 2022?
- (6 points) Suppose the government adopts the chain-linked approach to measure the real GDP. What is the cumulative real GDP growth rate between 2020 and 2022?

備

註

- 作答於試題上者，不予計分。
- 試題請隨卷繳交。

考試科目	經濟學	系所別	商學院共同科	考試時間	2月6日(二)第二節
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4. Suppose the nominal exchange rate between the dollar and the euro is 2 euros per dollar. Answer the following questions.

a. (5 points) The price of a book in Europe is 20 euros. If the purchasing power parity holds, how much will the same book cost in the United States?

b. (10 points) If the price level in the U.S. is 120 and the price level in Europe is 150, what is the real exchange rate in terms of European goods per U.S. good? By how much is the Euro undervalued or overvalued than predicted by the purchasing-power parity?

c. (5 points) If the nominal exchange rate between the dollar and the euro becomes 1.5 euros per dollar, what will happen to U.S. net capital outflow?



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	系所別	風險管理與保險學系管理組	考試時間	2 月 6 日(二)第 4 節
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1. Suppose the density function of random variable  $T$  is as follows:

$$f(t) = 0, t < 0$$

$$fe^{-2t}, 0 < t < \infty$$

- (a) Find  $f$ . (10%)  
 (b) Find  $P\{T > 2\}$ . (10%)

2. An academic study shows that a test water well drilled in a particular county should strike water with probability of 0.1. What is the probability that the fourth water strike comes on the sixth well drilled? (15%)

3. Suppose the reaction of a student to a situation in an experiment may take one of the following two forms, X or Y. If an experimenter wishes to estimate the probability  $p$  that a student will react in form X and expects  $p$  to be 0.6, how many students must be included in the experiment? Assume that the error of estimation is less than 0.08 with probability equal to 0.9 ( $z_{0.05} = 1.645$ ;  $z_{0.025} = 1.96$ ;  $z_{0.0099} = 2.33$ ;  $\Phi(1.50) = 0.9332$ ,  $\Phi(1.58) = 0.9429$ ,  $\Phi(1.64) = 0.9495$ , where  $\Phi(x) = Pr(X \leq x)$ ). (15%)

4. Suppose that  $T_1$  and  $T_2$  are random variables and have the joint density function given by

$$f(t_1, t_2) = 6(1 - t_2), 0 \leq t_1 \leq t_2 \leq 1$$

$$0, \text{ otherwise}$$

- (a) Find  $E(T_1)$ . (10%)  
 (b) Find  $V(T_2)$ . (10%)  
 (c) Find  $E(T_1 - 3T_2)$ . (10%)

5. (a) What is an unbiased estimator? (10%)  
 (b) What is an efficient estimator? (10%)

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	微積分	系所別	國際貿易系 李維華(10)	考試時間	2月6日(二)第二節
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**Problem 1 (20 points) (10 % each)**

Evaluate the integral

(a)

$$\int x^\alpha \ln x \, dx, \alpha \in \mathbb{R}.$$

(b)

$$\int_1^\infty \frac{x^2 - 3}{(x^2 - 2x + 3)(x^2 + 2x + 3)} dx.$$

**Problem 2 (10 points)**

(a) Evaluate the limit

$$I_m = \lim_{n \rightarrow \infty} \sum_{i=1}^{nm} \frac{i^2 n^3}{n^6 + i^6},$$

where  $m$  is a positive integer.

(b) Compute  $\lim_{m \rightarrow \infty} I_m$ .

**Problem 3 (10 points)**

Suppose that the function  $f(x)$  is continuous on  $[a, b]$  and differentiable on  $(a, b)$ , and  $0 < a < b$ . If  $f(a) = ka$ ,  $f(b) = kb$  for some  $k$ , show that there exists  $c \in (a, b)$  such that the tangent line of  $y = f(x)$  at  $c$  passes through the origin.

**Problem 4 (10 points)**

If  $y = f(u)$  and  $u = g(x)$ , where  $f$  and  $g$  are twice differentiable functions, with  $g(0) = 1$ ,  $f(1) = 2$ ,  $g'(0) = 2$ ,  $f'(1) = -1$ ,  $g''(0) = 1$ , and  $f''(1) = 3$ , Find  $\frac{d^2 y}{dx^2} \Big|_{x=0}$ .

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	微積分	系所別	政大數學系 微積分班	考試時間	2 月 6 日(二) 第二節
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**Problem 5 (10 points)**

Evaluate the the iterated integral

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

**Problem 6 (10 points)**

Find the values of  $a$  for which the improper integral

$$\int_1^{\infty} \frac{dx}{x^a(1+\sqrt{x})}$$

converges.

**Problem 7 (15 points)**

Let  $I_n = \int_0^{\infty} x^n e^{-x} dx.$

- (a) Find the recursive relation between  $I_n$  and  $I_{n-1}.$
- (b) Compute  $I_3.$
- (c) Find the general formula of  $I_n.$

**Problem 8 (15 points)**

Find the local maximum and minimum values and saddle point(s) of the function

$$f(x, y) = x^3 - y^3 + 3x^2 + 3y^2 - 9x.$$

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	系 所 別	風險管理與保險學系 精算科學組	考 試 時 間	2 月 6 日 (二) 第 4 節
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1. (20 pts) Please explain the following items.
  - (a) (10 pts) Bayesian Estimates and Minimax Principle
  - (b) (10 pts) Uniformly Most Powerful Tests
  
2. (10pts) An application processor for a small life insurance and annuity company processes all applications for both products. Applications arrive according to a Poisson process at a rate of 6 per hour and any one application has probability 0.4 of being for an annuity policy. Calculate the probability that the next 3 applications received are for life insurance. \_\_\_\_\_ (A) 0.18 (B) 0.22 (C) 0.26 (D) 0.30 (E) 0.34
  
3. (10 pts) Let  $X_1, X_2, \dots, X_{30}$  be a random sample from a uniform distribution on  $(0, 1)$ . Let  $X_{(1)} \leq X_{(2)} \leq X_{(3)} \leq \dots \leq X_{(30)}$  be the order statistics. Determine the cumulative distribution Function  $F_Y(y)$ , of  $Y = X_{(4)}$  for  $0 < y < 1$ .
  
4. (10 pts) Let  $\{x_i\}_{i=1}^n$  be an independent and identically distributed sample from a Poisson distribution with parameter  $\lambda$ . Calculate the maximum likelihood estimator of the parameter  $E(X_i^2)$ , denoted as  $T$ . Explain the asymptotic distribution of  $T$  (Please specify the distribution name and parameters).
  
5. (15 pts) Let the conditional probability that a person insured at age  $x$  will attain age  $x + t$  is given by

$$\left( \frac{1+x}{1+x+t} \right)^3, \forall t > 0$$

- (a) (5 pts) Calculate the probability that this insured person will die within two years at age 20.
- (b) (10 pts) Estimate this insured person's expected future life time at age 41.

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6. (15pts) Let  $X$  have the p.d.f.

$$f(x; \theta) = \begin{cases} \theta^x(1 - \theta)^{1-x}, & 0 \leq x \leq 1 \\ 0, & \text{elsewhere} \end{cases}$$

We test the simple hypothesis  $H_0 : \theta = \frac{1}{4}$  against the alternative composite hypothesis  $H_1 : \theta < \frac{1}{4}$  by taking a random sample of size 10 and rejecting  $H_0$  if and only if the observed values  $x_1, x_2, \dots, x_{10}$  of the sample items are such that  $\sum_{i=1}^{10} x_i \leq 1$ . Find the power function  $K(\theta)$ ,  $\theta \leq \frac{1}{4}$ , of this test.

7. (20pts) A drunken man wanders around randomly in a large space. At each step, he moves one unit of distance North, South, East, or West, with equal probabilities. Choose coordinates such that his initial position is  $(0, 0)$  and if he is at  $(x, y)$  at some time, then one step later he is at  $(x, y + 1)$ ,  $(x, y - 1)$ ,  $(x + 1, y)$ , or  $(x - 1, y)$ . Let  $(X_n, Y_n)$  and  $R_n$  be his position and distance from the origin after  $n$  steps, respectively.

General hint: note that  $X_n$  is a sum of random variables with possible values  $-1, 0, 1$ , and likewise for  $Y_n$ , but be careful throughout the problem about independence.

- (a) (5 pts) Determine whether or not  $X_n$  is independent of  $Y_n$  (explain clearly).
- (b) (10 pts) Find  $Cov(X_n, Y_n)$ . (Please simplify.)
- (c) (5 pts) Find  $E(R_n)$ . (Please simplify.)

備 註

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