微積分（丙）

(50%) 1. Evaluate the limit if it exists.

(1) $\lim_{x\to 0} x \sin\frac{1}{x}$.

(2) $\lim_{k\to\infty} \sum_{n=1}^{k} \frac{1}{n(n+1)}$.

(3) $\lim_{x\to 0} \left(\frac{1}{x^2} - \frac{1}{x^2 \sec x}\right)$.

(4) $\lim_{(x,y)\to(0,0)} \frac{3x^2y}{x^2+y^2}$.

(5) $\lim_{n\to\infty} \frac{2}{n}\left[\left(\frac{n+2}{n}\right)^2+\left(\frac{n+4}{n}\right)^2+\cdots+\left(\frac{n+2n}{n}\right)^2\right]$.

(10%) 2. At what point of the curve $x+\sqrt{xy}+y=1$ is the tangent line parallel to the axis?

(10%) 3. Determine if it is possible to assign a finite number to represent the measure of the area of the region bounded by the curve whose equation is $y=(e^x+e^{-x})^{-1}$ and the X-axis.
If a finite number can be assigned, find it.

(15%) 4. Determine the interval of convergence of the power series

$$\sum_{n=1}^{\infty} \frac{n!\,x^n}{n^n}$$

(15%) 5. The function $f(x, y)=6x^2-8X+2y^2-5$ is continuous on the closed region R defined by $x^2+y^2\leq 1$. find its absolute extrema over R.

統計學

1. If X_1, X_2 be two independent random variables and $E(X_1)-E(X_2)=\theta$, $V(X_1)=2V(X_2)$, Let a statistic $\mu=K_1X_1+K_2X_2$, find real numbers of K1 and K_2 such that (1) U is an unbiased estimator of θ (2) For all linear unbiased estimator of θ, V (u) be the smallest. (12%)

2. find the distribution of the random variable X and the values of μ and σ^2 when the m.g.f. of X is given by: (16%)

(a) $M(t)=e^{4(e^t-1)}$

(b) $M(t)=\frac{e^{5t}-e^{4t}}{t}$, $t\neq 0$

$=1$, $t=0$

3. Let $X\sim b(x;\ 4,\ P)$, $Y\sim b(Y;\ 5,\ P)$, and $W=X+Y$. If we are known that $P(X\geq 4)=0.0016$, find the p. d. f. of W. (12%)

4. Let X be $N(\mu,\ 500^2)$. To test H_0: $\mu=5000$ against H_1: $\mu\neq 5000$. Assume that $\bar{X}=5050$ is the sample mean of a random sample of size n=400, Use $\alpha=0.05$

(a) Use a contidence interval estimation procedure to test this hypothesis.

(b) Use a standardized test statistic to test this hypothesis.

(c) Use the p-value for this test to test this hypothesis.

5. The Chebyshev inequality is used to claim that a random variable, X, has a probability of no more than 5% of being less than 20 or more than 50. What estimates of the mean and the variance of X are being used? (12%)

6. Let X have an exponential distribution with p.d.f. $f(x, \theta) = \theta e^{-\theta x}$, $X \geq 0$

To test Ho: $\theta = 2$ against H1: $\theta < 2$, We reject Ho if and only if $X \geq 1$.

(a) Find P(I)

(b) Find P(II) if $\theta = 1$.

7. Let X and Y have the joint p.d.f. described as follows:

(X, Y)	f(x, Y)
(0, 0)	1/6
(1, 0)	2/6
(1, 1)	2/6
(2, 1)	1/6

Find the correlation coefficient and the best fitting line.

※ $Z_{0.025} = 1.96$, $Z_{0.05} = 1.645$, $Z_{0.01} = 2.33$, $Z_{0.02} = 2.06$ $Z_{0.0228} = 2.00$

國立政治大學保險研究所碩士班
研究生入學考試試題

八十三學年度

民法

一、何謂先訴抗辯權？同時履行抗辯權？（20%）

二、試述民事上損害賠償之方法及範圍。（30%）

三、甲承攬乙之二層樓建築，未料僅蓋一層後，即因乙吸煙不慎而焚燬，問甲可否拿到工資？（20%）

四、十八歲之甲將壓歲錢一萬元借給同學乙，嗣因乙遭逢家變，甲憐其困境，遂謂乙無須償還該一萬元。甲父聞之，甚怒，試爲甲父提供法律意見。（30%）

保險法

第一題：25%

要保人以支票交付保險費，保險事故發生，保險人須否負保險責任？試就不同險種並分別保險事故發生在票載發票日前後說明之。

第二題：25%

原被保險人得否請求再保險人給付再保險金？再保險人得否代位行使原被保險人對於第三人之損害賠償請求權？

第三題：20%

保險法第十八條：「被保險人死亡或保險標的物所有權移轉時，保險契約除另有訂定外，仍爲繼承人或承讓人之利益而存在」之規定及第二十條：「凡基於有效契約而生之利益，亦得爲保險利益」之規定，對於各種保險契約是否均可適用？

第四題：30%

保險法第六十四條於民國八十一年經二次修正，其修正重點及利弊如何？有無再修正之必要？若投保時與保險人主張被保險人違反告知義務解除契約時之法律規定不同，應以何者爲準？

會計學

一、甲公司於82年12月1日賒銷一批商品$30,000，條件爲2/10，n/30。12月10日收到1/3之貨款，又12月20日收到另1/3之貨款，12月25日在剩餘貨款中產生1/2銷貨退回。

試作：

在(a)總額法，(b)淨額法，及(c)備抵法下12月20日及年底必要之調整分錄。(12%)

二、忠孝公司82年度未查核前銷貨成本爲$500,000，淨利$100,000但經會計師查核發現：

(1) 期初存貨低估$5,000。

(2) 成本$20,000之進貨漏列，但已包含在期末存貨中。

(3) 成本$60,000之進貨（FOB起運點交貨）尚在途中，故未包含在期末存貨中。但公司在收到發票時，已列計進貨。

(4) 成本$7,000之進貨（FOB目的地交貨）尚在途中，但公司已列計進貨，且包含在期末存貨中。

(5) 承銷它公司之貨品$9,000被列入期末存貨中。

試作：

計算該公司正確之銷貨成本及淨利金額。(10%)

三、仁愛公司於79年1月1日購入機器$120,000，估計可使用8年，殘值$10,000，採倍數餘額遞減法計提折舊。80年7月1日該機器大

修，耗資$21,250，惟可增加其服務潛能，但不能增加使用年限。81年底計提折舊前，發現該機器尚可使用10年，殘值降爲$5,000。82年7月1日公司將該機器與東方公司交換相似機器，新機器公平市價$60,000，舊機器公平市價$70,000，因此仁愛公司將可收到現金$10,000。

試作：

(1) 80及81年度折舊費用之金額。(10%)

(2) 82年7月1日仁愛公司資產交換之分錄。(10%)

四、信義公司近年來平均毛利率爲25%，82年度期初應收帳款$50,000，應收帳款平均收款期間30天（一年以360天計），該年度銷貨金額爲期末應收帳款的9倍。

試作：

(1) 82年度期末應收帳款金額。(7%)

(2) 82年度銷貨成本金額。(7%)

五、和平公司於80年7月1日發行1,000張，5年期，面值$1,000，名義利率8%，有效利率10%之可轉換公司債。每年6月30日及12月31日付息，該公司採利息法攤銷折溢價。每張債券可轉換20股普通股。83年1月1日有500張債券轉換爲普通股，普通股每股面值爲$10，當時市價每股$53。

試作：

(1) 發行公司債時之分錄。(5%)

(2) 按(a)帳面價值法(b)市價法記載公司債轉換時之分錄。(18%)

(3) 83年12月31日以現金付息時之分錄。(5%)

期數	1元之複利現值			
	4%	5%	8%	10%
5	0.821927	0.783526	0.680583	0.620921
10	0.675564	0.613913	0.463193	0.385543

期數				
	4%	5%	8%	10%
5	0.451822	4.329477	3.992710	3.790787
10	8.110869	7.721735	6.710081	6.144567

六、您在查核正義公司82年度帳冊時，發現下列事項：

(1) 正義公司於80年1月1日以$1,000,000，取得甲公司40%之股權（對甲公司具有重大之影響力），當時甲公司淨資產公平市價爲$2,000,000。正義公司以成本法處理該項投資，於收到股利時貸記投資收入。下列爲甲公司有關淨利及股利之資料：

年度	淨利（損）	股利
80	$50,000	20,000
81	40,000	10,000
82	(10,000)	10,000

(2) 3年來期末存貨發生下列錯誤：

80年底	少計	$20,000
81年底	多計	45,000
82年底	少計	17,000

保險學

一、人壽保險與汽車保險於運用大多數法則時月何異同？此異同對於我國現階段壽險業和產險業的發展各有何影響？(25%)

二、我國即將推行全民健康保險，試就可能發生的道德危險(Moral Hazard)做一評估，並提出建議以期控制這些道德危險。(25%)

三、可保危險(Insurable Risk)必須具備那些要件？試以火災保險爲例，指出其可能違背可保危險原理之處並提出補救之道。(25%)

四、試以社會保險的基本原則申述我國推行國民（老人）年金制度應注意之要件。

統計學

25% 1. A sample size of n=100 has been drawn from a population whose variance is 2250 in order to test the following:

$$H_0 : \mu=1000$$
$$H_1 : \mu\neq1000$$

It is decided to reject H_0 if $\bar{x}>1008$ or if $\bar{x}<992$.

(a) Find the probability of a Type I error.

(b) Find the probability of a Type II error if $\mu=1005$.

25% 2. With a random sample of 30 observations, two multiple regression models were estimated.

$$\text{Model 1: } y=\beta_0+\beta_1x_1+\beta_2x_2+\beta_3x_1^2+\beta_4x_2^2+\beta_5x_1x_2+\varepsilon$$
$$\text{Model 2: } y=\beta_0+\beta_1x_1+\beta_2x_2+\varepsilon$$

The sum of squares for error for model 1 was 700, while the sum of squares for error for model 2 was 1100. Test at the 5% significance level to determine if model 1 is significantly better than model 2.

25% 3. The proprietor of a men's clothing store has recorded the buying behavior of customers over a long period of time. he has established that the probability that a customer will buy a shirt is about 0.4. A customer buys a tie 50% of the time when a shirt is purchased, but only 10% of the time when a shirt is not purchased. Find the probability that a customer buys the following:

a. a shirt and a tie

b. a tie

c. a shirt or a tie

d. a tie but not a shirt

25% 4. Determine the sample size necessary to estimate μ to

within 10 units with 99% confidence. We know that the range of the population is 200 units.

F distribution

Entries in the following table give F_α values, where α is the area or probability in the upper tail of the *F* distribution

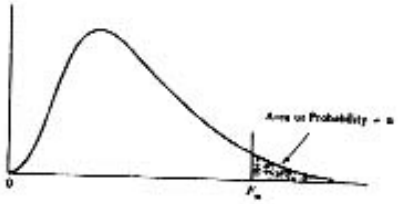
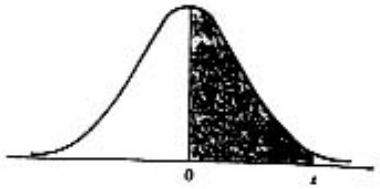


Table of $F_{.01}$ Values

Denominator Degrees of Freedom	Numerator Degrees of Freedom 1	2	3	4	5	6	7	8	9	10	12	15	20	24	30	40	60	120	∞
1	161.4	199.5	215.7	224.6	230.2	234.0	236.8	238.9	240.5	241.9	243.9	245.9	248.0	249.1	250.1	251.1	252.2	253.3	254.3
2	18.51	19.00	19.16	19.25	19.30	19.33	19.35	19.37	19.38	19.40	19.41	19.43	19.45	19.45	19.46	19.47	19.48	19.49	19.50
3	10.13	9.55	9.28	9.12	9.01	8.94	8.89	8.85	8.81	8.79	8.74	8.70	8.66	8.64	8.62	8.59	8.57	8.55	8.53
4	7.71	6.94	6.59	6.39	6.26	6.16	6.09	6.04	6.00	5.96	5.91	5.86	5.80	5.77	5.75	5.72	5.69	5.66	5.63
5	6.61	5.79	5.41	5.19	5.05	4.95	4.88	4.82	4.77	4.74	4.68	4.62	4.56	4.53	4.50	4.46	4.43	4.40	4.36
6	5.99	5.14	4.76	4.53	4.39	4.28	4.21	4.15	4.10	4.06	4.00	3.94	3.87	3.84	3.81	3.77	3.74	3.70	3.67
7	5.59	4.74	4.35	4.12	3.97	3.87	3.79	3.73	3.68	3.64	3.57	3.51	3.44	3.41	3.38	3.34	3.30	3.27	3.23
8	5.32	4.46	4.07	3.84	3.69	3.58	3.50	3.44	3.39	3.35	3.28	3.22	3.15	3.12	3.08	3.04	3.01	2.97	2.93
9	5.12	4.26	3.86	3.63	3.48	3.37	3.29	3.23	3.18	3.14	3.07	3.01	2.94	2.90	2.86	2.83	2.79	2.75	2.71
10	4.96	4.10	3.71	3.48	3.33	3.22	3.14	3.07	3.02	2.98	2.91	2.85	2.77	2.74	2.70	2.66	2.62	2.58	2.54
11	4.84	3.98	3.59	3.36	3.20	3.09	3.01	2.95	2.90	2.85	2.79	2.72	2.65	2.61	2.57	2.53	2.49	2.45	2.40
12	4.75	3.89	3.49	3.26	3.11	3.00	2.91	2.85	2.80	2.75	2.69	2.62	2.54	2.51	2.47	2.43	2.38	2.34	2.30
13	4.67	3.81	3.41	3.18	3.03	2.92	2.83	2.77	2.71	2.67	2.60	2.53	2.46	2.42	2.38	2.34	2.30	2.25	2.21
14	4.60	3.74	3.34	3.11	2.96	2.85	2.76	2.70	2.65	2.60	2.53	2.46	2.39	2.35	2.31	2.27	2.22	2.18	2.13
15	4.54	3.68	3.29	3.06	2.90	2.79	2.71	2.64	2.59	2.54	2.48	2.40	2.33	2.29	2.25	2.20	2.16	2.11	2.07
16	4.49	3.63	3.24	3.01	2.85	2.74	2.66	2.59	2.54	2.49	2.42	2.35	2.28	2.24	2.19	2.15	2.11	2.06	2.01
17	4.45	3.59	3.20	2.96	2.81	2.70	2.61	2.55	2.49	2.45	2.38	2.31	2.23	2.19	2.15	2.10	2.06	2.01	1.96
18	4.41	3.55	3.16	2.93	2.77	2.66	2.58	2.51	2.46	2.41	2.34	2.27	2.19	2.15	2.11	2.06	2.02	1.97	1.92
19	4.38	3.52	3.13	2.90	2.74	2.63	2.54	2.48	2.42	2.38	2.31	2.23	2.16	2.11	2.07	2.03	1.98	1.93	1.88
20	4.35	3.49	3.10	2.87	2.71	2.60	2.51	2.45	2.39	2.35	2.28	2.20	2.12	2.08	2.04	1.99	1.95	1.90	1.84
21	4.32	3.47	3.07	2.84	2.68	2.57	2.49	2.42	2.37	2.32	2.25	2.18	2.10	2.05	2.01	1.96	1.92	1.87	1.81
22	4.30	3.44	3.05	2.82	2.66	2.55	2.46	2.40	2.34	2.30	2.23	2.15	2.07	2.03	1.98	1.94	1.89	1.84	1.78
23	4.28	3.42	3.03	2.80	2.64	2.53	2.44	2.37	2.32	2.27	2.20	2.13	2.05	2.01	1.96	1.91	1.86	1.81	1.76
24	4.26	3.40	3.01	2.78	2.62	2.51	2.42	2.36	2.30	2.25	2.18	2.11	2.03	1.98	1.94	1.89	1.84	1.79	1.73
25	4.24	3.38	2.99	2.76	2.60	2.49	2.40	2.34	2.28	2.24	2.16	2.09	2.01	1.96	1.92	1.87	1.82	1.77	1.71
26	4.23	3.37	2.98	2.74	2.59	2.47	2.39	2.32	2.27	2.22	2.15	2.07	1.99	1.95	1.90	1.85	1.80	1.75	1.69
27	4.21	3.35	2.96	2.73	2.57	2.46	2.37	2.31	2.25	2.20	2.13	2.06	1.97	1.93	1.88	1.84	1.79	1.73	1.67
28	4.20	3.34	2.95	2.71	2.56	2.45	2.36	2.29	2.24	2.19	2.12	2.04	1.96	1.91	1.87	1.82	1.77	1.71	1.65
29	4.18	3.33	2.93	2.70	2.55	2.43	2.35	2.28	2.22	2.18	2.10	2.03	1.94	1.90	1.85	1.81	1.75	1.70	1.64
30	4.17	3.32	2.92	2.69	2.53	2.42	2.33	2.27	2.21	2.16	2.09	2.01	1.93	1.89	1.84	1.79	1.74	1.68	1.62
40	4.08	3.23	2.84	2.61	2.45	2.34	2.25	2.18	2.12	2.08	2.00	1.92	1.84	1.79	1.74	1.69	1.64	1.58	1.51
60	4.00	3.15	2.76	2.53	2.37	2.25	2.17	2.10	2.04	1.99	1.92	1.84	1.75	1.70	1.65	1.59	1.53	1.47	1.39
120	3.92	3.07	2.68	2.45	2.29	2.17	2.09	2.02	1.96	1.91	1.83	1.75	1.66	1.61	1.55	1.50	1.43	1.35	1.25
∞	3.84	3.00	2.60	2.37	2.21	2.10	2.01	1.94	1.88	1.83	1.75	1.67	1.57	1.52	1.46	1.39	1.32	1.22	1.00

Areas under the standard normal distribution

The following table gives the areas under the standard normal curve from 0 to z.



z	0	1	2	3	4	5	6	7	8	9
0.0	.0000	.0040	.0080	.0120	.0160	.0199	.0239	.0279	.0319	.0359
0.1	.0398	.0438	.0478	.0517	.0557	.0596	.0636	.0675	.0714	.0754
0.2	.0793	.0832	.0871	.0910	.0948	.0987	.1026	.1064	.1103	.1141
0.3	.1179	.1217	.1255	.1293	.1331	.1368	.1406	.1443	.1480	.1517
0.4	.1554	.1591	.1628	.1664	.1700	.1736	.1772	.1808	.1844	.1879
0.5	.1915	.1950	.1985	.2019	.2054	.2088	.2123	.2157	.2190	.2224
0.6	.2258	.2291	.2324	.2357	.2389	.2422	.2454	.2486	.2518	.2549
0.7	.2580	.2612	.2642	.2673	.2704	.2734	.2764	.2794	.2823	.2852
0.8	.2881	.2910	.2939	.2967	.2996	.3023	.3051	.3078	.3106	.3133
0.9	.3159	.3186	.3212	.3238	.3264	.3289	.3315	.3340	.3365	.3389
1.0	.3413	.3438	.3461	.3485	.3508	.3531	.3554	.3577	.3599	.3621
1.1	.3643	.3665	.3686	.3708	.3729	.3749	.3770	.3790	.3810	.3830
1.2	.3849	.3869	.3888	.3907	.3925	.3944	.3962	.3980	.3997	.4015
1.3	.4032	.4049	.4066	.4082	.4099	.4115	.4131	.4147	.4162	.4177
1.4	.4192	.4207	.4222	.4236	.4251	.4265	.4279	.4292	.4306	.4319
1.5	.4332	.4345	.4357	.4370	.4382	.4394	.4406	.4418	.4429	.4441
1.6	.4452	.4463	.4474	.4484	.4495	.4505	.4515	.4525	.4535	.4545
1.7	.4554	.4564	.4573	.4582	.4591	.4599	.4608	.4616	.4625	.4633
1.8	.4641	.4649	.4656	.4664	.4671	.4678	.4686	.4693	.4699	.4706
1.9	.4713	.4719	.4726	.4732	.4738	.4744	.4750	.4756	.4761	.4767
2.0	.4772	.4778	.4783	.4788	.4793	.4798	.4803	.4808	.4812	.4819
2.1	.4821	.4826	.4830	.4834	.4838	.4842	.4846	.4850	.4854	.4857
2.2	.4861	.4864	.4868	.4871	.4875	.4878	.4881	.4884	.4887	.4890
2.3	.4893	.4896	.4898	.4901	.4904	.4906	.4909	.4911	.4913	.4916
2.4	.4918	.4920	.4922	.4925	.4927	.4929	.4931	.4932	.4934	.4936
2.5	.4938	.4940	.4941	.4943	.4945	.4946	.4948	.4949	.4951	.4952
2.6	.4953	.4955	.4956	.4957	.4959	.4960	.4961	.4962	.4963	.4964
2.7	.4965	.4966	.4967	.4968	.4969	.4970	.4971	.4972	.4973	.4974
2.8	.4974	.4975	.4976	.4977	.4977	.4978	.4979	.4979	.4980	.4981
2.9	.4981	.4982	.4982	.4983	.4984	.4984	.4985	.4985	.4986	.4986
3.0	.4987	.4987	.4987	.4988	.4988	.4989	.4989	.4989	.4990	.4990
3.1	.4990	.4991	.4991	.4991	.4992	.4992	.4992	.4992	.4993	.4993
3.2	.4993	.4993	.4994	.4994	.4994	.4994	.4994	.4995	.4995	.4995
3.3	.4995	.4995	.4995	.4996	.4996	.4996	.4996	.4996	.4996	.4997
3.4	.4997	.4997	.4997	.4997	.4997	.4997	.4997	.4997	.4997	.4998
3.5	.4998	.4998	.4998	.4998	.4998	.4998	.4998	.4998	.4998	.4998
3.6	.4998	.4998	.4999	.4999	.4999	.4999	.4999	.4999	.4999	.4999
3.7	.4999	.4999	.4999	.4999	.4999	.4999	.4999	.4999	.4999	.4999
3.8	.4999	.4999	.4999	.4999	.4999	.4999	.4999	.4999	.4999	.4999
3.9	.5000	.5000	.5000	.5000	.5000	.5000	.5000	.5000	.5000	.5000