一、 試比較國際企業(International corporations)，多國籍企業(Multdomestic corporations)及跨國企業(Transnational corporations)之差異。(15%)

二、 試述抗拒組織變革的原因及化解方法。(20%)

三、 賦權(Empowerment)之內涵爲何？ 敘述如何達成賦權的功能。(20%)

四、 試以利害關係人(Stakeholder)的立場，解析企業社會責任的對象及內涵。 (20%)

五、 衝突和組織績效有何關係？ 如何以衝突診斷模式(Conflict diagnostic model)，來研判衝突的嚴重性及解決之難易。(25%)

1. Let $f(x)=a_0x^n+a_1x^{n-1}+...+a_n$, $g(x)=b_0x^m+b_1x^{m-1}+...+b_m$, $a_0\neq 0$, $b_0\neq 0$, where m, n, are positive integer. Please determine whether each of the following is true or false.

   (a) (5 %) If $n<m$, then $\lim_{x\to\infty}\frac{f(x)}{g(x)}=0$,

   (b) (5 %) If $n>m$ and a_0, b_0 have the same sign, then $\lim_{x\to\infty}\frac{f(x)}{g(x)}=-\infty$,

   (c) (5 %) If $n=m$, then $\lim_{x\to\infty}\frac{f(x)}{g(x)}=\frac{a_0}{b_0}$.

2. (a) (5 %) Please prove that if $\sum_{n=1}^{\infty}a_n$ is convergent, then $\lim_{n\to\infty}a_n=0$.

   (b) (5 %) Please prove that $\lim_{n\to\infty}\frac{x^n}{n!}=0$, for every real x.

   (c) (5 %) Please use an infinite series to approximate $\int_0^1 e^{-x^2}dx$ to two decimal places.

3. Please evaluate the limit (if it exists) of the following two questions.

   (a) (10 %) $\lim_{x\to-\infty}\frac{\sqrt[10]{|x|}}{\sqrt[7]{10^7+\sqrt[5]{10^5+\sqrt[3]{x+10^3}}}}$ (b) (10 %) $\lim_{x\to+\infty}\frac{x^\beta}{e^{\alpha x}}$, $\alpha>0$, $\beta>0$

4. Please evaluate the limit (if it exists) of the following two questions.

   (a) (10 %) $\lim_{x\to\infty}x^2e^{-x^2}\int_0^x e^{t^2}dt$ (b) (10 %) $\lim_{n\to\infty}\sum_{k=0}^{n-1}\frac{1}{\sqrt{n^2+k^2}}$

5. (10 %) If $f(x)=\begin{cases}\frac{e^x-1}{xe^x}, & x\neq 0\\ 1, & x=0\end{cases}$, Please determine $f^{-1}(0)$.

6. (10 %) Let $F(x)=\int_0^x\frac{1}{1+t^2}dt+\int_0^{\frac{1}{x}}\frac{1}{1+t^2}dt$, $x>0$, show that $F(x)=\frac{\pi}{2}$ (Hint: First show that $F(x)$ is a constant function).

7. (10 %) Please find the Laplace Transformation of $f(x)=\sin 2x$, where the Laplace Transformation L of $f(x)$ is defined $L[f(x)]=\int_0^\infty e^{-sx}f(x)dx$ for every real number S.

經濟學 (國際企業管理研究所)

應以原子筆或鋼筆作答。可以中文、英文或中英合併之方式回答。

請寫明計算過程，才予計分。每題所佔之百分比皆附註於題後。

1. The TaiwanEcon Journal is considering offering a new service which will send news articles to readers by email. Their market research indicates that there are two types of potential users, impecunious undergraduates studying microeconomics and high-level executives. Let x be the number of articles that a user requests per year. The executives have an inverse demand function $P_E(x) = 100 - x$ and the undergraduates have an inverse demand function $P_U(x) = 80 - x$. The Journal has a zero marginal cost of sending articles via email.

(a) Suppose that the Journal can identify which of the users are undergraduates and which are executives. It decides to offer a plan where users can buy a fixed number of articles per year for a fixed price per year. If it wants to maximize total profit, what price and number of articles will be to undergraduates and executives? (10%)

(b) Consider the real world situation for this problem, you do think TaiwanEcon Journal's pricing policy will work? Why? (5%)

2. (a) Define monopolistic competition. (5%)

(b) Why is it difficult or impossible to define the market demand curve, the market supply curve, and equilibrium price under monopolistic competition? (5%)

(c)Explain why the monopolist would never produce on the inelastic portion of the demand curve. (5%)

3. The game of "chicken" is played by two macho teens who speed toward each other on a single-lane road. The first to veer off is branded the chicken whereas the one who doesn't turn gains peer group esteem. Of course, if neither veers, both die in the resulting crash. Payoffs to the chicken game are provided in the following table.

a. Does this game have a Nash equilibrium ? (5%)

b. Is a threat by either not to chicken-out a credible one ? (10%)

c. Would the ability of one player to firmly commit to a not-chicken strategy (by, for example, throwing away the steering wheel) be desirable for that player ? (5%)

		B's Strategies	
		Chicken	Not Chicken
A's Strategies	Chicken	2,2	1,3
	Not Chicken	3,1	0,0

4. Prof. DH buys a one-year government bond on January 1, 2001, for $500. He receives principal plus interest totaling $540 on January 1, 2002. Suppose that the CPI is 100 on January 1, 2001, and 110 on January 1, 2002. This increase in prices is more than DH had anticipated; his guess was that the CPI would be at 104 by the beginning of 2002. Find the nominal interest rate, the real interest rate, and DH's expected real interest rate. (10%)

5. A large open economy has desired national saving of $S^d = 20 + 200\, r^w$, and desired national investment of $I^d = 30 - 200\, r^w$. The foreign economy has desired national saving of $S^d_{For} = 40 + 100\, r^w$, and desired national investment of $I^d_{For} = 75 - 400\, r^w$. Please calculate the equilibrium values of the real world interest rate r^w, the domestic S, I, and CA. (12%)

6. Consider a closed economy with no government in which the per-worker production is $f(k) = 6k^{0.5}$, where y is output per worker and k is capital per worker. The saving rate is 10%, the population growth rate is 10% per year, and the depreciation rate of capital is 5% per year. What are the steady-state values of the capital-labor ratio, output per worker, consumption per worker? (10%)

7. Suppose the economy is characterized by the following equations:

   Desired consumption: $C^d = 130 + 0.5(Y-T) - 500\, r$

   Desired investment: $I^d = 100 - 500r$

   Real money demand: $L = 30+0.5Y - 1000i$

   Where i is the nominal interest rate, expected inflation rate is $p^e = 0.03$, government purchase and taxes are equal at $G = T = 100$, nominal money supply is $M = 1320$, and full employment level is $\bar{Y} = 500$.

   (1). Write the equations for IS and LM curves. (8 %)

   (2) Find the equilibrium values of the real interest rate and the price level. (6%)

   (3). What the equilibrium values of the output, real interest rate, and the price level if the amount of taxes collected by the government is decreased to 50? (4%)

個案 1：

Byte 公司生產個人電腦內的電子元件，有些被用於家庭，更常被用於企業和工程應用方面。這個產品的年度銷售量穩定地成長，在過去七年間總銷售額更是達到近乎兩億六千五百萬。過去六年中 Byte 的年度收益都能穩定地達到 12%，他們將總部設在美國的中西部，這被視爲爲了電路元件的供應和生產達到市場佔有率 32%所做的決策。

但國、內外許多新公司開始加入這個市場，雖然 Byte 的管理者（股東），樂意見到市場的成長擴大，確也顯示出一個重要的問題：Byte 若不能滿足市場上電路元件的需求，則目前的領導地位隨時都有可能被其他競爭者所取代。爲了維持他們的領導地位，所以他們考慮到籌設新廠的問題，但新的工廠設備最快三年後才能完成且上線。由於建新廠的三年期間，很可能發生產能不足的窘況，一開始公司管理階層想到以下兩個解決方案：

（一）提高價格，走產品精緻化路線=>顧客鎖定特定對象，但市場卻縮小
（二）利用技術授權的方式到國外設廠=>管理不易，還有許多衍生的問題

但幾經考慮之後，發現上述兩種方式都行不通。於是最終的解決方式被提出以供董事會裁決。以下是這個方案的大致內容：

租賃一間在東北部一個叫做 Plainville 的小鎮已經關閉的工廠作爲暫時補充產能的來源。這家工廠在未關閉之前也是生產電子元件的，這個小鎮地處偏遠，當地的居民多是勞工階級。採用這家廢棄工廠的主要優、缺點如下所述：

=>優點：（1）不需要使用技術授權的方式
（2）品質控制容易
（3）不用抬高產品的價錢
缺點：與 Byte 的市場運輸連絡不足

行動計畫：Byte 公司在 Plainville 小鎮設廠並招收 1200 名左右的工人，並預計三年後等新廠建好後撤廠。

董事會的成員之一W先生力排眾議，基於企業社會道德的考慮堅決反對這個方案。如此公司經營高階 E 先生再度面臨兩難的局面，究竟在利潤和社會道德應該選擇哪一邊？

Q1：請問這個方案可能會造成什麼社會道德的問題（15%）？
Q2：你有沒有較好的建議提供給 E 先生，讓他跳脫上述兩難局面（20%）。

個案2：

某中型電腦軟體公司之程式設計人員約有三十人，採專案方式編組。換句話說，這些人是依公司接案情況，機動劃分爲若干個小組，案子結束後，又再重新編組。由於人員流動及個人成長的差異性，他們之間的功力水準大不相同。雖然都有定期的進修課程，但或是因爲時間壓力，或是因爲個人學習潛力，成長的情形並不是太好。

L、P、O三位是大家公認的高手。其中L、O兩位不太愛幫助同仁解決自己的進度，而P先生則心地較好，幾乎有問必答，有時爲了怕講解太多，耽誤了時間，甚至乾脆加夜班幫別人完成工作。然而這樣一來，自己的體力、時間、工作進度，甚至家庭生活都受到影響。而L、O兩位由於不太協助別人，人緣雖不如P，但績效較好，個人的學習與成長也比較快。因而上級對他們兩位的重視程度也日益升高。

P看到這種情形，頗有倦勤另謀他職之意。資淺同仁聽說此事，紛紛力圖挽留，甚至聯名請上級出面來留住P先生。

Q1：請問上述個案透露出何種組織問題（15%）？
Q2：你對P先生和公司高階有何建議（20%）。

個案3：

以下是近日一則新聞報導：

國立大學競相成立「大學系統」，四所公、私立大學部分學生爲了凸顯校方結盟決策過程未徵詢學生意見並抗議國立大學爲了搶錢，也跳出來揚言成立「台灣平等大學系統」。

十二所國立大學陸續成立三個「大學系統」，學生也來湊一腳。聯盟發言人台大社會系學生姚光祖表示，反對公立大學假借教學資源整合之名，任意自組聯盟，分明是爲了向教育部搶奪教育資源，將嚴重排擠其他學校發展，更擴大台灣公、私立大學間的不平等。

Q1：請簡要評述上列報導（15%）。
Q2：假如您是教育部長，你將如何設計有效管理機制以有效提升大學競爭力（15%）？

1. (5 %) If a contractor's profit on a international trading can be looked upon as a continuous random variable having the probability density

$$f(x)=\begin{cases}\frac{1}{18}, & \text{for } -1<x<5\\ 0, & \text{elsewhere}\end{cases},$$

where the units are one thousand dollars, what is the *expected profit*?

2. Please find approximate values for the probability that a random variable x having the chi-square distribution with 50 degrees of freedom takes on a value greater than 68.0

   (a) (5 %) by treating $\frac{x-\nu}{\sqrt{2\nu}}$ with $\nu=50$ as a random variable having the standard normal distribution;

   (b) (5 %) by treating $\sqrt{2x}-\sqrt{2\nu}$ with $\nu=50$ as a random variable having the standard distribution.

3. (15 %) Please show that the F distribution with 4 and 4 degrees of freedom is given by

$$g(F)=\begin{cases}6F(1+F)^{-4}, & \text{for } F>0\\ 0, & \text{for } F\le 0\end{cases},$$

and please use this density to determine the probability that for independent random samples of size 5 from two normal populations having the same variance, s_1^2/s_2^2, will take on a value less than 1/2 or greater than 2.

(Note: $g(y)=\begin{cases}\frac{\Gamma(\frac{\nu_1+\nu_2}{2})}{\Gamma(\frac{\nu_1}{2})\Gamma(\frac{\nu_2}{2})}(\frac{\nu_1}{\nu_2})^{\frac{\nu_1}{2}}\cdot y^{\frac{\nu_1}{2}-1}(1+\frac{\nu_1}{\nu_2}\cdot y)^{-\frac{1}{2}(\nu_1+\nu_2)}, & \text{for } y>0\\ 0, & \text{elsewhere}\end{cases}$,

is the density of F distribution with ν_1 and ν_2 degrees of freedom.)

4. A single observation is to be used to test the null hypothesis that the parameter of the exponential distributions equals 10 against the alternative hypothesis that it does not equal 10. If the null hypothesis is to be rejected if and only if the observed value is less than 8 or greater than 12, find

   (a) (10 %) the probability of a Type I error;

   (b) (10 %) the probabilities of Type II errors when $\theta=2$, 4 and 8.

   Also plot the graph of the power function.

5. (10 %) Suppose that independent random samples of size n from two normal populations with the known variances σ_1^2 and σ_2^2 are to be used to test the null hypothesis $\mu_1-\mu_2=\delta$ against the alternative hypothesis $\mu_1-\mu_2=\delta'$, and that

the probabilities of type I an Type II errors are to have the pre-assigned values α and β. Please show that the required size of the samples is given by

$$E(x|y).$$

Also use this formula to find n when $\sigma_1 = 12$, $\sigma_2 = 15$, $\delta = 110$, $\delta' = 113$, $\alpha = 0.01$ and $\beta = 0.01$.

6. (10 %) Given the joint probability

$$f(x, y) = \begin{cases} \frac{2}{5}(2x+3y), & \text{for } 0 < x < 1 \text{ and } 0 < y < 1 \\ 0, & \text{elsewhere} \end{cases},$$

please find $E(y|x)$ and $E(x|y)$.

7. (15 %) In some problem it is desired to fit a parabola of the form

$y = \beta_0 + \beta_1 x + \beta_2 x^2$ to set of paired data (x_1, y_1), (x_2, y_2), ..., (x_n, y_n).

Minimizing

$$\sum_{i=1}^{n} [y_i - (\beta_0 + \beta_1 x_i + \beta_2 x_i^2)]^2$$

with respect to β_0, β_1 and β_2, derive a set of normal equations, whose solution will yield the least square estimates of β_0, β_1 and β_2.

8. (15 %) To compare the effectiveness of three different types of phosphorescent coatings of airplane instruct dials, eight dials each are coated with the three types. Then the dials are illuminated by an ultraviolet light, and the following are the number of minutes each glowed after the light source was shut off:

Type 1	Type 2	Type 3
52.9	58.4	71.3
62.1	55.0	66.6
57.4	59.8	63.4
50.0	62.5	64.7
59.3	64.7	75.8
61.2	59.9	65.6
60.8	54.7	72.9
53.1	58.4	67.3

Test the null hypothesis that there is no difference in the effectiveness of the three coating at the level of significance $\alpha = 0.01$.

THE STANDARD NORMAL DISTRIBUTION

z	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
0.0	.0000	.0040	.0080	.0120	.0160	.0199	.0239	.0279	.0319	.0359
0.1	.0398	.0438	.0478	.0517	.0557	.0596	.0636	.0675	.0714	.0753
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	.2257	.2291	.2324	.2357	.2389	.2422	.2454	.2486	.2517	.2549
0.7	.2580	.2611	.2642	.2673	.2704	.2734	.2764	.2794	.2823	.2852
0.8	.2881	.2910	.2939	.2967	.2995	.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	.4817
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

VALUES OF $F_{.01,\nu_1,\nu_2}$*

ν_1 = Degrees of freedom for numerator

ν_2 = Degrees of freedom for denominator	1	2	3	4	5	6	7	8	9	10	12	15	20	24	30	40	60	120	∞
1	4,052	5,000	5,403	5,625	5,764	5,859	5,928	5,982	6,023	6,056	6,106	6,157	6,209	6,235	6,261	6,287	6,313	6,339	6,366
2	98.5	99.0	99.2	99.2	99.3	99.3	99.4	99.4	99.4	99.4	99.4	99.4	99.4	99.5	99.5	99.5	99.5	99.5	99.5
3	34.1	30.8	29.5	28.7	28.2	27.9	27.7	27.5	27.3	27.2	27.1	26.9	26.7	26.6	26.5	26.4	26.3	26.2	26.1
4	21.2	18.0	16.7	16.0	15.5	15.2	15.0	14.8	14.7	14.5	14.4	14.2	14.0	13.9	13.8	13.7	13.7	13.6	13.5
5	16.3	13.3	12.1	11.4	11.0	10.7	10.5	10.3	10.2	10.1	9.89	9.72	9.55	9.47	9.38	9.29	9.20	9.11	9.02
6	13.7	10.9	9.78	9.15	8.75	8.47	8.26	8.10	7.98	7.87	7.72	7.56	7.40	7.31	7.23	7.14	7.06	6.97	6.88
7	12.2	9.55	8.45	7.85	7.46	7.19	6.99	6.84	6.72	6.62	6.47	6.31	6.16	6.07	5.99	5.91	5.82	5.74	5.65
8	11.3	8.65	7.59	7.01	6.63	6.37	6.18	6.03	5.91	5.81	5.67	5.52	5.36	5.28	5.20	5.12	5.03	4.95	4.86
9	10.6	8.02	6.99	6.42	6.06	5.80	5.61	5.47	5.35	5.26	5.11	4.96	4.81	4.73	4.65	4.57	4.48	4.40	4.31
10	10.0	7.56	6.55	5.99	5.64	5.39	5.20	5.06	4.94	4.85	4.71	4.56	4.41	4.33	4.25	4.17	4.08	4.00	3.91
11	9.65	7.21	6.22	5.67	5.32	5.07	4.89	4.74	4.63	4.54	4.40	4.25	4.10	4.02	3.94	3.86	3.78	3.69	3.60
12	9.33	6.93	5.95	5.41	5.06	4.82	4.64	4.50	4.39	4.30	4.16	4.01	3.86	3.78	3.70	3.62	3.54	3.45	3.36
13	9.07	6.70	5.74	5.21	4.86	4.62	4.44	4.30	4.19	4.10	3.96	3.82	3.66	3.59	3.51	3.43	3.34	3.25	3.17
14	8.86	6.51	5.56	5.04	4.70	4.46	4.28	4.14	4.03	3.94	3.80	3.66	3.51	3.43	3.35	3.27	3.18	3.09	3.00
15	8.68	6.36	5.42	4.89	4.56	4.32	4.14	4.00	3.89	3.80	3.67	3.52	3.37	3.29	3.21	3.13	3.05	2.96	2.87
16	8.53	6.23	5.29	4.77	4.44	4.20	4.03	3.89	3.78	3.69	3.55	3.41	3.26	3.18	3.10	3.02	2.93	2.84	2.75
17	8.40	6.11	5.19	4.67	4.34	4.10	3.93	3.79	3.68	3.59	3.46	3.31	3.16	3.08	3.00	2.92	2.83	2.75	2.65
18	8.29	6.01	5.09	4.58	4.25	4.01	3.84	3.71	3.60	3.51	3.37	3.23	3.08	3.00	2.92	2.84	2.75	2.66	2.57
19	8.19	5.93	5.01	4.50	4.17	3.94	3.77	3.63	3.52	3.43	3.30	3.15	3.00	2.92	2.84	2.76	2.67	2.58	2.49
20	8.10	5.85	4.94	4.43	4.10	3.87	3.70	3.56	3.46	3.37	3.23	3.09	2.94	2.86	2.78	2.69	2.61	2.52	2.42
21	8.02	5.78	4.87	4.37	4.04	3.81	3.64	3.51	3.40	3.31	3.17	3.03	2.88	2.80	2.72	2.64	2.55	2.46	2.36
22	7.95	5.72	4.82	4.31	3.99	3.76	3.59	3.45	3.35	3.26	3.12	2.98	2.83	2.75	2.67	2.58	2.50	2.40	2.31
23	7.88	5.66	4.76	4.26	3.94	3.71	3.54	3.41	3.30	3.21	3.07	2.93	2.78	2.70	2.62	2.54	2.45	2.35	2.26
24	7.82	5.61	4.72	4.22	3.90	3.67	3.50	3.36	3.26	3.17	3.03	2.89	2.74	2.66	2.58	2.49	2.40	2.31	2.21
25	7.77	5.57	4.68	4.18	3.86	3.63	3.46	3.32	3.22	3.13	2.99	2.85	2.70	2.62	2.53	2.45	2.36	2.27	2.17
30	7.56	5.39	4.51	4.02	3.70	3.47	3.30	3.17	3.07	2.98	2.84	2.70	2.55	2.47	2.39	2.30	2.21	2.11	2.01
40	7.31	5.18	4.31	3.83	3.51	3.29	3.12	2.99	2.89	2.80	2.66	2.52	2.37	2.29	2.20	2.11	2.02	1.92	1.80
60	7.08	4.98	4.13	3.65	3.34	3.12	2.95	2.82	2.72	2.63	2.50	2.35	2.20	2.12	2.03	1.94	1.84	1.73	1.60
120	6.85	4.79	3.95	3.48	3.17	2.96	2.79	2.66	2.56	2.47	2.34	2.19	2.03	1.95	1.86	1.76	1.66	1.53	1.38
∞	6.63	4.61	3.78	3.32	3.02	2.80	2.64	2.51	2.41	2.32	2.18	2.04	1.88	1.79	1.70	1.59	1.47	1.32	1.00