問答題：每題 25 分，不限字數，答題時請標明題號。

（一）、我國的調查局一方面在法務部屬下，執行司法警察的工作，一方面須接受國家安全局指揮，執行政治偵防工作。最近，新任法務部長表示對調查局有無力感，雙方衝突公開化。請引用組織理論加以分析，並提出解決之道。

（二）、中山大學企管所博士班成立已經超過十年，如果您受邀評估其成效，您將如何進行？並說明如何讓您的評估結果具有說服力？

（三）、台灣的企業集團（如台塑集團、和信集團、遠東集團等）與日本的 *Keiretsu* 及韓國的 *Chaebol* 皆為東亞經濟圈中比較具有特色的組織形式（organizational form），請引用三個你所熟悉的管理理論或組織理論來解釋企業集團的形成原因及發展過程，並分析其優劣。

（四）、In the mid-1980s, **American Cyanamid Company**, a large U.S. chemicals manufacturer, changed the way in which it conducted performance appraisals of its workers. At roughly the same time, **Merck**, a large U.S. pharmaceutical manufacturer, changed its performance evaluation system. Both companies were quite pleased with how the changes worked out. Both reported general acceptance by their workforce. The interesting thing is that each adopted roughly the type of system that the other was in the process of abandoning.

Before the change, American Cyanamid had a system in which workers were rated as being in one of three major categories. There was a "curve" for the three categories; each manager had to rank 20% of her subordinates in the highest category, and 40% in each of the other two. This was felt to be arbitrary and inequitable; in a small group with an outstanding worker, other very good workers might have little chance of getting the highest ranking. The fixed percentages hurt cooperation among co-workers, who were essentially placed in competition with one another.

To deal with these problems, American Cyanamid adopted a system with three categories. Almost everyone was placed in the middle category; outstanding workers could be placed in the highest category, and those needing immediate improvement could be put in the lowest. There was no quota for either extreme. Ratings were done on an absolute basis by the evaluating manager, with the understanding that the percentages in the two extreme categories should be small. Employees, freed from the arbitrariness of the percentage quotas, responded very positively.

Merck, in contrast, began with an evaluation system in which there were many summary levels of performance to which an individual could be assigned (thirteen in all). Assignment was done on an absolute basis by supervisors. It transpired that most employees (73%) fell within three "upper-middle" levels, with little difference among the three levels in terms of consequences for salary. Managers would lump almost everyone together because they didn't feel comfortable making broader distinctions, and because it was difficult to live with the disgruntlement that ensued when someone was ranked markedly below the ranking given a co-worker. Employees complained that this gave them little in the way of motivation. So Merck decided to try a new system, with four levels and fixed percentages for each. Although there were some complaints, employees and management generally felt good about the change, saying that this forced managers into making distinctions, so that merit would finally be rewarded.

The businesses of American Cyanamid and Merck are not identical, but they are more alike than many. Yet here they are, going in basically opposite directions concerning performance evaluation at the same point in time, and both claiming to be making progress. How is this possible? Should employees be evaluated on an absolute scale or on some sort of relative basis? Should forced distribution be used in performance evaluation?

一、觀念題 (共 40 分)

1. 請說明統計假設檢定中「型 I 錯誤」(type I error)、「型 II 錯誤」(type II error) 和「檢定力」(power of test)的意義。　　　　　　　　(15 分)

2. 在「隨機區集設計」(randomized block design)中設計「區集」(block)的用意為何？請簡要說明之。　　　　　　　　(5 分)

3. 複迴歸分析中「判定係數」(coefficient of determination)和「偏判定係數」(coefficient of partial determination)各有什麼功用？　　　　　　　　(10 分)

4. 因素分析(factor analysis)在萃取共同因素之後，常須再進行因素的「轉軸」(rotation)，為什麼？　　　　　　　　(10 分)

二、計算題 (共 60 分: 每題 20 分)

1. The admissions officer for Clearwater College developed the following estimated regression equation relating final college GPA to the student's SAT mathematics score and high-school GPA.

$$\hat{y} = -1.41 + .0235x_1 + .00486x_2$$

where

x_1 = high-school grade point average
x_2 = SAT mathematics score
y = final college grade point average

A portion of the Minitab computer output follows.

```
The regression equation is
Y = -1.41 + .0235 X1 + .00486 X2

Predictor         Coef        Stdev       t-ratio
Constant        -1.4053      0.4848       _____
X1              0.023467     0.008666     _____
X2              _____     0.001077     _____

s = 0.1298     R-sq = _____     R-sq(adj) = _____

Analysis of Variance

SOURCE        DF         SS        MS         F
Regression   _____    1.76209   _____    _____
Error        _____    _____    _____
Total          9       1.88000
```

a. Complete the missing entries in this output.
b. Compute F and test at a .05 level of significance to see whether a significant relationship is present.
c. Did the estimated regression equation provide a good fit to the data? Explain.
d. Use the t test and $\alpha = .05$ to test $H_0: \beta_1 = 0$ and $H_0: \beta_2 = 0$.

[You may need the tabulated values: $F_{2,7,0.05}$=4.74, $t_{7,0.025}$=2.365 .]

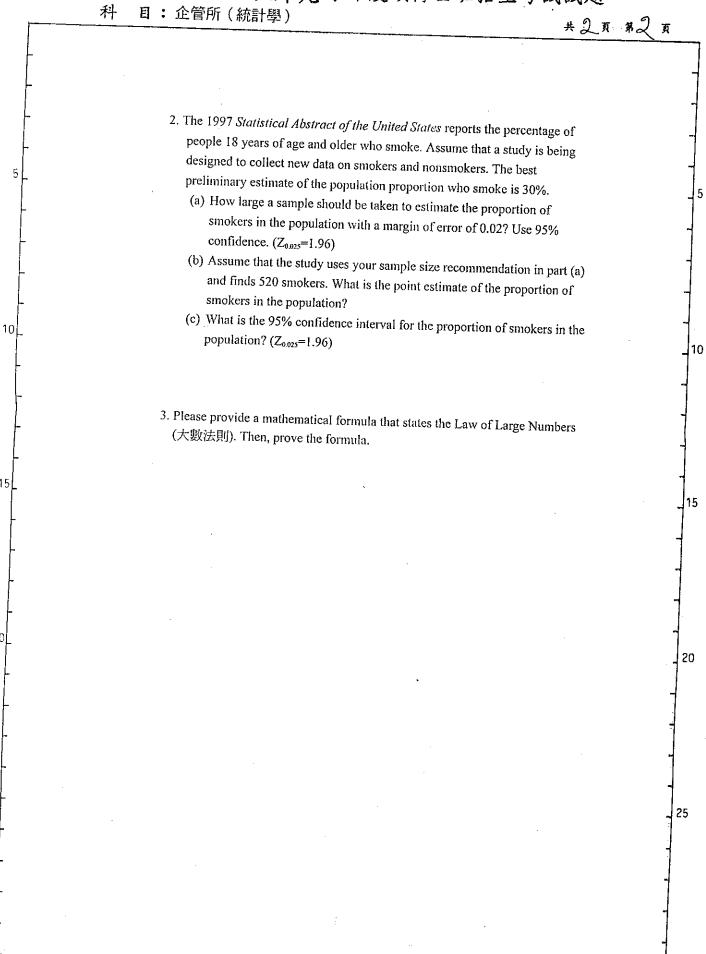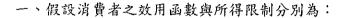2. The 1997 *Statistical Abstract of the United States* reports the percentage of people 18 years of age and older who smoke. Assume that a study is being designed to collect new data on smokers and nonsmokers. The best preliminary estimate of the population proportion who smoke is 30%.

   (a) How large a sample should be taken to estimate the proportion of smokers in the population with a margin of error of 0.02? Use 95% confidence. ($Z_{0.025}=1.96$)

   (b) Assume that the study uses your sample size recommendation in part (a) and finds 520 smokers. What is the point estimate of the proportion of smokers in the population?

   (c) What is the 95% confidence interval for the proportion of smokers in the population? ($Z_{0.025}=1.96$)

3. Please provide a mathematical formula that states the Law of Large Numbers (大數法則). Then, prove the formula.

一、假設消費者之效用函數與所得限制分別為：

$$U = x_1^{\alpha} x_2^{\beta} \qquad I = p_1 x_1 + p_2 x_2$$

式中，U 為效用；

　　　I 為消費者所得；

　　　x_i，$i=1,2$ 分別表示不同之商品或服務；

　　　p_i，$i=1,2$ 表示不同商品或服務之價格

　　　α, β 則為大於 0 的參數。

試推導普通需求函數、受補償需求函數、間接效用函數、支出函數。(25%)

二、請建構數理模型分析下列二小題：(25%)

　　(a)在不完全競爭市場架構，政府課徵「利潤稅」是否具有中立性(Neutrality)？(10%)

　　(b)若廠商有兩本帳(Two Book Record)刻意進行漏稅活動，則利潤稅對產出決策之影響為何？(15%)

三、假設企業主與勞動者皆為風險趨避者，其效用函數均為二次式之型式，請證明在此一假設下之利潤分享(Profit-Sharing)契約型式為 $W(\theta_i) = a + b\pi(\theta_i)$，式中 $W(\theta_i)$ 與 $\pi(\theta_i)$ 分別是在 i 狀態之工資與利潤，a 與 b 均為參數。(25%)

四、「新經濟」之特質為何？試著以適當之經濟學說加以闡釋；在全球化之「新經濟」體系下政府之角色如何扮演?其總體經濟政策又應如何制定？(25%)