

所別：企業管理學系碩士班 一般甲組(一般生) 科目：統計學 共 2 頁 第 1 頁
企業管理學系碩士班 一般乙組(一般生)
企業管理學系碩士班 一般丁組(一般生)
企業管理學系碩士班 一般戊組(一般生)

本科考試禁用計算器

*請在試卷答案卷(卡)內作答

請用藍、黑色筆作答

1. Consider the output information shown on regression analysis: $R_{adj}^2, \hat{\beta}_1, \text{MSE}$, and F , which one is not a *Statistic*. Distinguish the difference between *statistic* and *non-statistic* information. (10%)
2. How to compare the variation of bivariate distribution for two groups by covariance matrices Σ_1 and Σ_2 ? (5%)
3. The partially completed ANOVA for a 3x4 factorial experiment with two replications is shown below:

Source	SS	df	MS	F
A	0.8			
B	5.3			
AxB	9.6			
Error				
Total	17.0			

- (1) Complete the ANOVA table. (15%)
- (2) Test to determine whether the main effects are warrant. Use $\alpha=0.05$ and interpret the result. (10%)
4. What *statistic(s)* can be used for conducting *post-hoc test* in ANOVA? Explain the features of these *statistic(s)*. (10%)
5. Let $X_i, i=1, 2, \dots, 48$ be independent random variables, each being uniform distributed over $(0, 1)$. Calculate $P\left\{\sum_{i=1}^{48} X_i \geq 26\right\}$. (10%)
6. Consider the lifetime T is exponential distributed with density function $f(t) = \lambda e^{-\lambda t}, t \geq 0$, Find $E(T - t | T \geq t)$. (10%)
7. The k -th degree of polynomial regression model is given as

$$Y = \beta_0 + \beta_1 X + \beta_2 X^2 + \dots + \beta_k X^k + \varepsilon$$
 What *statistic(s)* can be used to determine the k value for obtaining the best-fit results? (10%)
8. The scatter plots in Fig. 1 depict the relationship between the volatility Y and credit rating X_1 by two different markets (E: Emerging, D: Developed). Develop a suitable regression model to test the moderating effect of market type X_2 on the relationship between volatility Y and credit rating X_1 , and discuss the testing procedure including hypothesis and *statistic(s)*. (20%)

注意：背面有試題

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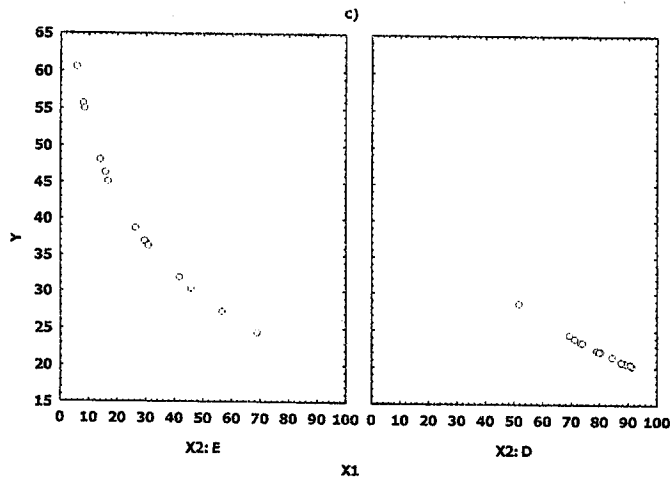


Fig 1 The scatter plot Y vs X1 by X2

Note:

Z denotes as standard normal distribution

$$P(0 \leq Z \leq 1) = 0.3413 \quad P(0 \leq Z \leq 2) = 0.4772$$

$$F_{3,4,0.05} = 6.59 \quad F_{2,3,0.05} = 9.55 \quad F_{6,12,0.05} = 3.0$$

注意：背面有試題