國立彰化師範大學九十六學年度碩士班招生考試試題

系所：資訊管理學系 **科目：統計**

★★請在答案紙上作答★★

1. X 的機率密度函數如下：(20%)

$$f(x)=\begin{cases} Cx & if\ 0\le x\le 2 \\ 0 & otherwise \end{cases}$$

試求 (1) C (2) F(x) (3) E(X) (4) V(X)

2. 從大三學生中隨機抽取男生與女生各十位，記錄其「資訊管理」成績得到下列統計量：女生平均值為 85 分，標準差為 7 分；男生平均值為 80 分，標準差 5 分。以 $\alpha = 0.1$ 檢定男生與女生的平均成績是否相等？
($F_{(0.05;\ 10,\ 10)}$=2.98, $F_{(0.05;\ 9,\ 9)}$=3.18, $t_{(0.1;\ 19)}$=1.328, $t_{(0.05;\ 19)}$=1.729, $t_{(0.1;\ 18)}$=1.330, $t_{(0.05;\ 18)}$=1.734) (20%)

3. To test the effects of a mobile learning training project, 7 engineers took tests before and after the training course. The results are given below.

Programmer	1	2	3	4	5	6	7
Before	830	990	1210	1000	750	1120	1120
After	970	1070	1300	1010	850	1170	1070

Can we say that the mobile learning project is a success?
Use α=0.05. ($t_{(0.05;7)}$=1.895, $t_{(0.025;7)}$=2.365, $t_{(0.05;\ 6)}$=1.943, $t_{(0.025;\ 6)}$=2.447) (20%)

4. Keynes is assessing the consumer acceptance of a mobile hotel booking system. He hypothesizes that the acceptance rate will be identical between Taipei city and Changhua city. His student randomly selects a sample of 300 consumers in Taipei city (Population 1) and a sample of 400 consumers in Changhua city (Population 2). Eighty-one of the Taipei consumers have high behavioral intentions to use the mobile hotel booking system, as did forty of the Changhua consumers.
(1) Test Keynes's hypothesis using $\alpha = 0.05$. (10%)
(2) Find the 95% confidence interval for the difference between the two population proportions (i.e., P1－P2). (10%)

5. A graduate student majoring in MIS would like to understand the determinants of customer loyalty in the context of e-commerce. Based on a sample of 15 e-commerce users, he developed the following estimated regression model involving three independent variables to predict customer e-loyalty.

$CL = b_0 + b_1\,CS + b_2\,SC + b_3\,PR$

$= 19.1 + 8.5\,CS + 18.0\,SC - 4.5\,PR$

The dependent variable CL represents customer e-loyalty, while the independent variables CS, SC, and PR represent customer satisfaction, switching cost, and perceived risk, respectively. The estimates of the standard deviations of b_1, b_2, and b_3 are $S_{b1} = 2.4$, $S_{b2} = 9.5$, and $S_{b3} = 0.9$, respectively.
(1) Would you recommend dropping any of the independent variables from the model?
Using α=0.05. ($t_{(0.05;\ 12)}$=1.782, $t_{(0.025;\ 12)}$=2.179, $t_{(0.05;\ 11)}$=1.796, $t_{(0.025;\ 11)}$=2.201) (15%)
(2) Based on the results of your test, please provide some insights into the management of customer e-loyalty. (5%)