

國立彰化師範大學 97 學年度碩士班招生考試試題

系所：資訊管理學系碩士班

科目：統計

☆☆請在答案紙上作答☆☆

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1. 已知機率函數如下：(20%)

$$f(x) = \begin{cases} kx(1-x) & \text{if } 0 < x < 1 \\ 0 & \text{otherwise} \end{cases}$$

試求(1)k 值，(2) $P(x > 0.2)$ ，(3)平均數，(4)中位數。

2. 若 $f(X) = \theta e^{-\theta x}$ ， $X \geq 0$ ，欲檢定 $H_0: \theta = 10$ ， $H_1: \theta = 8$ ，棄卻域 $C = \{X | X \leq 0.1\}$ ，試求 α 及 β 風險。(20%)

3. 某電子商務公司想了解性別差異對於消費金額的影響，其隨機抽樣 100 位男生，150 位女生，結果顯示男生平均每次消費 1,800 元，標準差 500 元，女生平均每次消費 1,500 元，標準差 450 元。 $(F_{(0.025; 99, 149)} = 1.4234)$

(1) 試問男生與女生每次消費金額之變異數是否有顯著差異($\alpha = 0.05$)？(10%)

(2) 試問男生與女生每次消費金額之平均數是否有顯著差異($\alpha = 0.05$)？(10%)

4. An electronic auctioneer would like to understand the factors affecting sales effects in the online auction market through an experimental design. Three auction durations and four initial bidding prices are chosen for this experiment. The results are as follows.

Auction duration	Initial bidding price			
	\$1	\$10	\$50	\$100
1 day	109; 110	110; 115	108; 110	110; 106
5 days	110; 112	110; 111	112; 109	114; 112
10 days	116; 114	112; 115	114; 119	120; 117

Please conduct an ANOVA test and draw conclusions using $\alpha = 0.05$. (20%)

$(F_{(0.025; 2, 12)} = 5.1, F_{(0.025; 3, 12)} = 4.47, F_{(0.025; 6, 12)} = 3.73, F_{(0.05; 2, 12)} = 3.89, F_{(0.05; 3, 12)} = 3.49, F_{(0.05; 6, 12)} = 3)$

5. A click-and-brick company wants to test the effect of CRM implementation on service staff productivity. The monthly production rates for a sample of service staffs before and after a CRM implementation are shown below.

Staff	1	2	3	4	5	6	7
Before	59	64	65	50	58	55	61
After	62	60	63	65	68	64	71

Can we say that the CRM implementation has a significant positive influence on service staff productivity? Use $\alpha = 0.05$. $(t_{(0.05; 7)} = 1.895, t_{(0.025; 7)} = 2.365, t_{(0.05; 6)} = 1.943, t_{(0.025; 6)} = 2.447)$ (20%)