# 國立成功大學

# 112學年度碩士班招生考試試題

編　號：228、231

系　所：會計學系<br>財務金融研究所

科　目：統計學

日　期：0207

節　次：第 3 節

備　註：可使用計算機

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※ 考生請注意：本試題可使用計算機。　請於答案卷(卡)作答，於本試題紙上作答者，不予計分。

一、選擇題 50 分(每題五分)

1. The test for the equality of two population variances assumes:

(a) that the population variances are known.

(b) that the population variances are equal.

(c) that each of the two populations are normally distributed.

(d) that the means of the two populations are equal.

2. In the stock market has a 5-day work per week. If we want to measure the impact of the day of the week on stock market performance we would need ____ indicator variables.

(a) 7

(b) 6

(c ) 5

(d) 4

3. One hundred students took a test on which the mean score was 73 with a variance of 64. A grade of A was given to all who scored 85 or better. Approximately how many A' s were there, assuming scores were normally distributed? (Choose the closest) (a) 42　(b) 7　(c) 58　(d) 22

4. If the coefficient of correlation equals 0.61, it indicates that the proportion of the variation in the dependent variable explained by the variation in the independent variables is:

(a) 37%　(b) 61%　(c) 98%　(d) cannot be determined.

5. The average starting salary for graduates at a university is $25000 with a standard deviation of $2000. How many of the graduates would have a starting salary between $21000 and $29000 ?

(a) At least 75%　(b) at least 89%　(c) at least 68%　(d) at least 95%

6. Autocorrelation in a regression forecasting model be detected by the (a) F test (b) Mann-Whitney test (c) Durbin-Watson test (d) Kruskal-Wallis test

7. In a telephone survey, respondents are asked to provide the level of satisfaction about a policy using a scale of 0 to 100. What is the level of measurement about satisfaction? (a) Nominal (b) Ordinal (c) Interval (d) Ratio.

8. Let $X_1$ and $X_2$ be observations of a random sample from a distribution with p. d. f. $f(x)=2x, \quad 0<x<1$, zero elsewhere. Evaluate the conditional probability $\Pr(X_1<X_2 \mid X_1<2X_2)$.

(a) 3/8 (b) 8/17 (c) 4/7 (d) 3/11

9. In time series analysis
(a) the sequencing of measurements is usually at discrete, regular intervals
(b)one should remember that analysis is always multivariate as opposed to univariate analysis
(c) autocorrelation of the values of the series is unacceptable
(d)observations are nearly always measured at the end of some period of time

10. One way to remove seasonality from a series is to
(a) take a moving average of 3 periods.
(b) take a moving average equal to twice the seasonal length.
(c) take a moving average of 12 periods.
(d) take a moving average equal to the seasonal length.

二、非選擇題 50 分

1. (8%)設台大男生參加各種運動的比例如下：

| 羽球 | 桌球 | 網球 | 羽球及桌球 | 羽球及網球 | 桌球及網球 | 三者皆有 |
|---|---|---|---|---|---|---|
| 30% | 20% | 20% | 5% | 10% | 5% | 2% |

今隨意抽取一名男生，請計算以下機率：
①至少參加一種運動。
②僅為羽球員。
③若將至少參加一種運動的稱為運動員，則該名男生，已知其為運動員，而他參加羽球的機率為何？
④該名男生已知其為桌球員，而他三項都參加的機率為何？

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2. (10%)若有一均勻分配，Y～U ($a$,$b$)

(a) (6%)試求其累積機率分配函數 F ($Y$)。(以 $a$ ， $b$ 表示)

(b) (4%)以期望值及變異數之定義，導出其望值 $E[Y]$ 與變異數 $V[Y]$

3. (12%)離散型隨機變數 $Y$ 之機率分配如下表，試求

| $y$ | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| $p(y)$ | 0.1 | 0.2 | 0.3 | 0.4 |

(a) $E[Y]$，$E[Y^2+3Y+1]$

(b) $V(Y)$，$V(3Y+4)$

(c) $E[\frac{1}{Y}]$

4. (10%) 假設美代爾公司所生產的 CPU，其運作時間恰為一連續型隨機變數 Y(單位：年)，機率密度函數為

$$f(y)=\begin{cases}(1/2)y & , \quad 0\le y\le 2\\ 0 & , \quad \text{其他範圍}\end{cases}$$

(a) 美代爾公司所生產的 CPU，期望使用時間為幾年？

(b) 一天，李先生買了一顆此品牌之 CPU，試問此顆 CPU 使用時至少超過一年的機率為何？

5. (10%) 自一成功率為 $p$ 的幾何分配抽取一組樣本 $X_1, X_2, \cdots, X_n$，試求 $p$ 的最大概似估計式。