



【注意】：

1. 不可攜帶工程型或具統計功能之計算機！
2. 答案請依題號順序作答，請勿將題號順序錯亂或顛倒；並清楚標示題號後，於每題題號後面寫出所選答案！
3. 計算過程不計分，請另於他處計算，答案與計算過程不可混在一起！
4. 未寫題號作答或將計算過程與答案混在一起者，不予給分！

一、單選題(30%)：每題(含小題)3 分

1. If the correlation coefficient between X and Y is equal to 1, then
 - (A) $Y=f(X)$
 - (B) Covariance between X and Y is equal 0
 - (C) Covariance between X and Y is equal 1
 - (D) Covariance between X and Y can be any real number
 - (E) None of the above
2. Let Y_1 and Y_2 have the joint *p.m.d.*
 $f(y_1, y_2) = 3y_1, 0 \leq y_2 \leq y_1 \leq 1$, zero elsewhere. Find the following value:
 - (1) $E(Y_1)=$
(A) 0.42 (B) 0.25 (C) 0.5 (D) 0.128 (E) 0.75
 - (2) $E(Y_1 - Y_2)=$
(A) 0.5 (B) 0.375 (C) 0.125 (D) 0.25 (E) 0.75
 - (3) $Cov(Y_1, Y_2)=$
(A) 0.02 (B) -0.16 (C) 0.16 (D) -0.02 (E) 0.08
3. Consider the following data: 5, 7, 4, 5, 22, 6, 12, 9, 5, 6. The median is
(A) 5 (B) 8.1 (C) 6 (D) 6.5 (E) 5.5
4. Which of the following statements is correct regarding the percentile points of the F -distribution?
 - (A) $F_{0.10, 8, 15} = 1/F_{0.90, 8, 15}$
 - (B) $F_{0.90, 8, 15} = 1/F_{0.10, 15, 8}$
 - (C) $F_{0.10, 8, 15} = 1/F_{0.10, 15, 8}$
 - (D) $F_{0.90, 8, 15} = 1/F_{0.90, 15, 8}$
 - (E) None of the above
5. If $P(A)=0.5, P(B | A)=0.35, P(A \cup B)=0.72$, then $P(B)=$
(A) 0.52 (B) 0.35 (C) 0.18 (D) 0.04 (E) None of the above



6. Let U have a uniform distribution given by $g(u) = \frac{1}{30}$, $0 < u < 30$, zero elsewhere. Then the mean of U is
 (A) 15 (B) 30 (C) $\frac{1}{30}$ (D) 60 (E) 6
7. Which of the following sampling distributions is needed for the matched pair comparison for means?
 (A) the chi-square distribution
 (B) the binomial distribution
 (C) the standard normal distribution
 (D) the t distribution
 (E) the F distribution
8. A population has a mean of 195 and a standard deviation of 30. A sample of 100 observations will be taken. The probability that the mean from that sample will be between 198 and 201 is
 (A) 0.4772 (B) 0.3413 (C) 0.0228 (D) 0.1587 (E) 0.1359

二、複選題(20%)：每題 5 分

9. The variation of a distribution can be measured by
 (A) mean (B) median (C) range (D) variance (E) standard deviation
10. Let X have a Bernoulli distribution with $p=0.4$ and Y have a Poisson distribution with mean=3. Let X and Y are independent. Then
 (A) $E(X+Y)=3.4$
 (B) $E(10X-Y)=1$
 (C) $Var(Y)=9$
 (D) $Var(Y-X)=2.76$
 (E) $Cov(X, Y)=0$
11. Select correct items about testing $H_0: \mu=\mu_0$ versus $H_1: \mu \neq \mu_0$ for a normal population mean μ at α level of significance:
 (A) Reject H_0 if the $100(1-\alpha)\%$ confidence interval for μ does not include μ_0 .
 (B) $Pr(\text{Critical region} | H_0) = \alpha$
 (C) $Pr(\text{critical region} | H_1) = Pr(\text{Type II error})$
 (D) $Pr(\text{accept } H_0 | H_1) = \text{the power}$
 (E) $Pr(\text{reject } H_0 | H_0) = p\text{-value}$
12. Which are not the nominal variables among the following demographic variables?
 (A) ages (B) living areas (C) sexes (D) heights (E) occupations



- 一、雲林股份有限公司進口三部包裝咖啡的機器，現在各隨機抽取 5 包，得其重量的平均數及不偏變異數如下：

機器別	重量平均數	變異數
A	28	16
B	35	11
C	30	12

假設此資料適合進行變異數分析，請回答下列問題：

- (1) 在顯著水準 $\alpha=0.05$ 下，檢定三部機器所包裝產品重量的平均數是否完全相等？(10%)
 - (2) 求 C 產品平均重量 μ_C 之 95% 的信賴區間。(10%)
 - (3) 求 B 產品與 A 產品平均重量差 $\mu_B - \mu_A$ 之 95% 的信賴區間。(10%)
- ($F_{(0.95; 2, 12)} = 3.89$; $F_{(0.975; 2, 12)} = 5.10$; $F_{(0.95; 2, 15)} = 3.68$; $F_{(0.975; 2, 15)} = 4.77$;
 $t_{(0.95, 12)} = 1.782$; $t_{(0.95, 15)} = 1.753$; $t_{(0.975, 12)} = 2.179$; $t_{(0.975, 15)} = 2.131$)

- 二、表中 X 是全球經濟成長率，Y 是某個國家的經濟成長率

X	-2	-1	0	1	2
Y	2	1	0	4	3

請回答下列問題：

- (1) 用最小平方法求出 Y 對 X 的直線迴歸係數 b_1 的估計值。(10%)
- (2) 試求判定係數(co efficient of determination)並解釋其意義。(5%)
- (3) 樣本相關係數 r 與迴歸係數最小平方估計值 b_1 有什麼關係？(5%)