

國立高雄應用科技大學
106 學年度研究所碩士班招生考試
工業工程與管理系碩士班
統計學

試題 共 2 頁，第 1 頁

注意：a.本試題共 5 題，每題 20 分，共 100 分

b.作答時不必抄題

c.考生作答前請詳閱答案卷之考生注意事項

- 1 Find the (1) sample mean (2) sample median (3) sample mode (4) sample variance of a random sample of 13 weights of product A
18, 21, 52, 48, 36, 57, 30, 23, 36, 50, 34, 25, 48.
- 2 Let X and Y have the following joint probability density function
 $f(x, y) = x + y$, $0 < x < 1$, $0 < y < 1$
Find (1) $\rho_{X,Y}$ (2) $E(X|Y)$.
- 3 The number of hits on a website follows a Poisson distribution, with a mean of 27 hits per hour.
(1) Use Normal distribution to find the probability that there will be 90 or more hits in three hours.
(2) Use Normal distribution with correction to find the probability that there will be 90 or more hits in three hours.
- 4 Let $X_1, X_2, X_3 \sim B(1, P)$ where p is unknown.
(1) Find the MSE of $\hat{\theta}_1 = 2X_1$.
(2) Find the MSE of $\hat{\theta}_2 = X_1 + X_2 + X_3$.
- 5 A sample of 100 boys aged 6-11 was weighed, and 35 of them were overweight. A sample of 100 girls aged 6-11 was also weighed, and 20 of them were overweight.
(1) Find a 95% confidence interval for the difference in overweight proportions between the boys and girls.
(2) Test the hypothesis that the overweight proportions of boys and girls are all equal, at the $\alpha = 0.05$ significance level.

$$F_{8,9,0.975} = 4.1020 \text{ 、 } F_{9,8,0.975} = 4.3572 \text{ 、 } F_{5,5,0.995} = 14.9394 \text{ 、 } F_{9,5,0.975} = 6.6810 \text{ 、 }$$

$$F_{5,9,0.975} = 4.4844 \text{ 、 } F_{5,5,0.95} = 5.0503 \text{ 、 } F_{13,11,0.975} = 3.3917 \text{ 、 } F_{11,13,0.975} = 3.1975 \text{ 、 }$$

$$F_{16,12,0.975} = 3.1515 \text{ 、 } F_{12,16,0.975} = 2.8891 \text{ 、 } F_{1,\infty,0.95} = 3.8415 \text{ 、 } F_{12,\infty,0.95} = 1.7522 \text{ 、 }$$

$$F_{22,\infty,0.95} = 1.56 \text{ 、 } F_{\infty,\infty,0.95} = 1 \text{ 、 } F_{\infty,1,0.95} = 254.32 \text{ 、 } F_{\infty,12,0.95} = 2.2962 \text{ 、 } F_{\infty,22,0.95} = 1.7831 \text{ 、 }$$

$$F_{1,24,0.95} = 4.2597 \text{ 、 } F_{1,26,0.95} = 4.2252 \text{ 、 } F_{24,1,0.95} = 249.05 \text{ 、 } F_{26,1,0.95} = 249.5 \text{ 、 }$$

$$F_{12,15,0.95} = 2.4753 \text{ 、 } F_{15,12,0.95} = 2.6169 \text{ 、 } F_{15,11,0.975} = 3.3299 \text{ 、 } F_{11,15,0.975} = 3.0078 \text{ 、 }$$

$$F_{12,10,0.975} = 3.6210 \text{ 、 } F_{10,12,0.975} = 3.3735 \text{ 、 } F_{2,15,0.975} = 4.7650 \text{ 、 } F_{2,15,0.95} = 3.6823$$

$$t_{17,0.975} = 2.1098 \text{ 、 } t_{10,0.995} = 3.1693 \text{ 、 } t_{14,0.975} = 2.1448 \text{ 、 } t_{10,0.95} = 1.8125 \text{ 、 } t_{24,0.975} = 2.0639 \text{ 、 }$$

$$t_{28,0.975} = 2.0484 \text{ 、 } t_{22,0.975} = 2.0739 \text{ 、 } t_{26,0.975} = 2.0555 \text{ 、 } t_{49,0.95} = 1.684 \text{ 、 } t_{50,0.95} = 1.6759 \text{ 、 }$$

$$t_{23,0.975} = 2.069$$

$$\chi_{9,0.95}^2 = 16.92 \text{ 、 } \chi_{9,0.975}^2 = 19.02$$

$$Z_{0.8133} = 0.89 \text{ 、 } Z_{0.8264} = 0.94 \text{ 、 } Z_{0.9} = 1.2816 \text{ 、 } Z_{0.925} = 1.4395 \text{ 、 } Z_{0.95} = 1.645 \text{ 、 } Z_{0.975} = 1.96$$