國立高雄大學 101 學年度研究所硕士班招生考試試題

科目：統計學
考試時間：100 分鐘

系所：
經營管理研究所(甲組、乙組)　　是否使用計算機：是
本科原始成績：100 分

I.　Fill the blank　　　　　　　　　　　　　　　　　　　　　　　　　　(40%)

1.　If A and B are independent events with P(A) = 0.2 and P(B) = 0.6, then P(A ∪ B) = _____ .

2.　In the textile industry, a manufacturer is interested in the number of blemishes or flaws occurring in each 100 feet of material.　The probability distribution that has the greatest chance of applying to this situation is the _____ distribution.

3.　A property of a point estimator that occurs whenever larger sample sizes tend to provide point estimates closer to the population parameter is known as _____ .

4.　The value of Durbin-Watson statistic is _____ when no autocorrelation is present

5.　Twenty percent of the students in a class of 100 are planning to go to graduate school. The standard deviation of this binomial distribution is _____ .

6.　A continuous random variable is uniformly distributed between 1 and 6.　Its probability density function is _____ .

7.　A theorem that allows us to use the normal probability distribution to approximate the sampling distribution of sample means and sample proportions whenever the sample size is large is known as the _____ .

8.　The manager of a restaurant believes that it takes a customer no more than 25 minutes to eat lunch.　The null and the alternative hypotheses are _____ .

9.　An acceptance sampling plan uses a sample of 18 with an acceptance criterion of zero. The probability of accepting shipments that contain 5% defective units is _____ .

10.　In a regression model involving 130 observations, the following estimated regression equation was obtained:

$$\hat{Y} = 17 + 4X_1 + 3X_2 + 8X_3 + 8X_4$$

The critical value of t for testing the significance of each of the independent variable's coefficients will have _____ degrees of freedom.

科目：統計學
考試時間：100 分鐘

系所：
經營管理研究所(甲組、乙組)　　是否使用計算機：是
本科原始成績：100 分

II. Part of an ANOVA table is shown below. (20%)

Source of Variation	Sum of Squares	Degree of Freedom	Mean Square	F
Between Treatments	64			8
Error (within treatments)			2	
Total	100			

   (a) Provide the missing entries for the ANOVA table.
   (b) Describe why the rejection region of the F-test is always on the right tail.

III. Let $Y_1, Y_2, \ldots, Y_n$ be a random sample of size n from a distribution with pdf (20%)

$$f(y;\theta) = \begin{cases} \theta(1+y)^{-(1+\theta)}, & 0 < y \\ 0, & y \le 0 \end{cases}$$

   (a) Find the maximum likelihood estimator of θ.
   (b) Find a sufficient statistic of θ.

IV. Define the following key terms **_by words only_**: (20%)

   (a) Sample space   (b) Random variable

   (c) Level of significance   (d) Statistical inference