系別：商管組三年級　　　　科目：統　計　學

可否使用計算機			
可		否	✓

本試題共 2 頁

P1
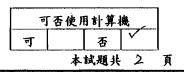
1) Let $X_1, X_2, \ldots, X_n$ be a random sample of size n. Using it, define the following: (18%)
   (a) Sample mean　　(b) Sample median　　(c) Sample mode
   (d) Sample variance　　(e) Sample standard deviation
   (f) The coefficient of variation.

2) (a) What is meant by "Events A, B are mutually exclusive"? (2%)

   (b) Let $A_1, A_2, \ldots, A_n$ be n mutually exclusive events such that $P(A_j) \neq 0$ for $j = 1, 2, \ldots, n$, and whose union is the entire sample space S. For any given event B such that $P(B) \neq 0$, state the Bayes' Law Formula for the posterior probabilities $P(A_j \mid B)$, $j = 1, 2, \ldots, n$. (6%)

   (c) The Graduate Management Admission Test (GMAT) is a requirement for all applicants of MBA programs. There are a variety of preparatory courses designed to help improve GMAT scores. Let A_1 be the event that an applicant gets GMAT score 650 or more, A_2 be the event that the applicant gets GMAT score less than 650, and B be the event that the applicant take preparatory course. Suppose $P(A_1) = 0.40$, $P(B \mid A_1) = 0.20$ and $P(B \mid A_2) = 0.05$.
   (i) Are A_1 and A_2 mutually exclusive? (2%)
   (ii) Compute $P(A_1 \cap B)$ and $P(A_2 \cap B)$. (6%)
   (iii) Compute $P(B)$. (4%)
   (iv) Apply Bayes' Law Formula to compute $P(A_1 \mid B)$ and $P(A_2 \mid B)$. (8%)

3) (a) Let Z be a standard normal random variable. That is, $Z \sim N(0,1)$. Let F_z be the distribution function of Z. What is the probability density function of Z? If $F_z(-a) = 0.121$, what is the value of $1 - F_z(a)$? (8%)
   (b) Let the random variable X have a Chi-Squared distribution with r degrees of freedom. What are the mean and variance of X? (6%)

4) Let $X_1, X_2, \ldots, X_n$ be a random sample of size n from a normal population with mean μ and known variance $\sigma^2 > 0$.
   (a) Give an unbiased estimator for μ. (4%)
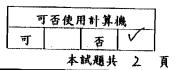   (b) Give a confidence interval for μ with confidence coefficient α, $0 < \alpha < 1$. (6%)

◀注意背面尚有試題▶

淡江大學 96 學年度轉學生招生考試試題　　56-2

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本試題共　2　頁

$P2$

5) To test the null hypothesis H_0 against the alternative H_1 by using a test.

  (a) What is a type I error for this test?　　　(4%)

  (b) What is a type II error for this test?　　(4%)

  (c) What is the power of this test?　　(4%)

  (d) Suppose that the null hypothesis is $H_0 : \theta > 170$ and the test statistic for this test is T, what is the $p - value$ of this test ? if $T = 175$.　　(4%)

6) (a) What is meant by a multinomial experiment?　　(6%)

  (b) Describe the Chi-Squared Goodness-of-fit Test.　　(8%)