注意事項	1. 本科目合計 100 分，答錯不倒扣。
	2. 請於答案卷上依序作答，並標註清楚題號（含小題）。
	3. 考完請將答案卷及試題一併繳回。

True/False Questions: (25%)

1. In general, when the sample size stays the same, the higher the level of confidence, the narrower the confidence interval. (5%)

2. The p-value is the chance that you are taking of making a type I error. (5%)

3. The degrees of freedom for the paired-observation t-test are n - 2. (5%)

4. The F ratio in an ANOVA is the ratio of the variation between samples to the variation within. (5%)

5. The correlation coefficient, r, measures the degree of any relationship between two variables. (5%)

Multiple Choice Questions: (75%)

1. Analysis of Variance (ANOVA) is a test for equality of: (5%)
   A) variances
   B) means
   C) proportions
   D) only two parameters
   E) none of the above

2. An insurance company wants to predict sales from the amount of money they spend on advertising. Which would be the independent variable? (5%)
   A) sales
   B) advertising
   C) insufficient information to decide

3. The measure of how well the regression line fits the data is the: (5%)
   A) coefficient of determination
   B) slope of the regression line
   C) mean square error
   D) standard error of the regression coefficient
   E) $s(b_0)$

背面尚有試題

4. To test whether or not two population variances are equal, the appropriate distribution is: (5%)
   A) z distribution
   B) chi-square distribution
   C) F distribution
   D) t distribution with $n_1 + n_2 - 2$ degrees of freedom
   E) none of the above

5. The proportion of defective items is not allowed to be over 15%. A buyer wants to test whether the proportion of defectives exceeds the allowable limit. The buyer takes a random sample of 100 items and finds that 19 are defective. State the null and alternative hypotheses for this test. (5%)
   A) $H_0: p \le .15, H_1: p > .15$
   B) $H_0: p \ge .15, H_1: p < .15$
   C) $H_0: p = .15, H_1: p > .15$
   D) $H_0: p = .15, H_1: p < .15$
   E) none of the above

6. Which of the following scales is the strongest type of scale of measurement ?　(5%)
   A) nominal　B) ordinal　C) interval　D) mode　E) ratio

7. A toddler store manager has sales data of coat sizes for the last year's sales. Which measure of central tendency should the manager use, if the manager is interested in the most sellable size ?　(5%)
   A) mean　B) mode　C) median　D) standard deviation　E) interquartile range

8. What is the probability of getting at least one three in four rolls of a single fair die ?　(5%)
   A) 0.2　B) 0.5177　C) 5/6　D) 1/6　E) 1/30

背面尚有試題

9. Which of the following statements is false ? (5%)

A) The distribution in which the mean and the variance are equal is the uniform distribution.

B) The binominal assumes that the probability of success stays the same for each trial.

C) The binominal assumes that the outcome of each trial is classified into two mutually exclusive categories.

D) The random variable that measures the time between two occurrences of a Poisson random variable is called an exponential random variable.

E) The probability that a continuous random variable takes on any particular value is always zero.

10. A truck gets involved in an accident 75% of the time if it is faulty. If it is not faulty, the probability reduces to 30%. 20% of all trucks are faulty. If a truck is involved in an accident, what is the probability that it was faulty ? (5%)

A) 0.225　B) 0.15　C) 0.3846　D) 0.06　E) 0.2412

11. A new liquid shampoo has a 75% success rate. Four customers are tested for it. What is the probability that at least three are attached to this new shampoo? (5%)

A) 0.4219　B) 0.3164　C) 0.5781　D) 0.7383　E) 0.6836

12. Twenty-five percent of all students in a school have a 3G cellular phone. In a random sample of fifteen students, what is the probability that exactly five have a 3G cellular phone? (5%)

A) 0.8349　B) 0.75　C) 0.8255　D) $(0.25)^5$　E) 0.1651

13. The age of people in a city is normally distributed, with a mean of 72 years and a standard deviation of 12 years. Find two values for age that will give a symmetric area around the mean such that they include an area equal to 0.75. (5%)

A) 52.26, 91.74　B) 56.64, 87.36　C) 58.2, 85.8　D) 63.9, 80.1　E) 48.48, 52.26

14. The height measurement of students in a university is normally distributed. The standard deviation is known to be five inches. It is found that 14% of the students have heights less than 60 inches. What proportion of students will have heights between 62 and 72 inches? (5%)

A) 0.0691　B) 0.2207　C) 0.4633　D) 0.6583　E) 0.3364

背面尚有試題

15. The average R&D expenditure in the computer industry is found to be $20,000 annually, with a standard deviation of $4,000. What is the probability that in a sample of 100 companies, the sample mean will be less than $19,500 ? (5%)
A) 0.1056   B) 0.0498   C) 0.8944   D) 0.4503   E) 0.9502