I. 單選題：每題 3 分。

1. Alpha (a) stands for
   A. the probability of any statistical test resulting in a Type I error.
   B. the probability that a statistical test involving a true null hypothesis will result in a Type I error.
   C. the proportion of statistical significant results for which the null hypothesis is true.
   D. the proportion of experiments that will attain statistical significance.
   E. the proportion of experiments for which the null hypothesis is false that will attain statistical significance.

2. If we are measuring the height of a child with a ruler in which the centimeters are divided into tenths, which of the following values is correctly reported? And which of the following values representing the average height of the male adults is adequately reported?
   A. 100.257 cm; 170 cm
   B. 89.12 cm; 168.54389 cm
   C. 78.357 cm; 171.1 cm
   D. 93.2 cm; 172.431 cm
   E. 58 cm; 173.55674 cm

3. Suppose that the scores of a particular English examination are normally distributed in the undergraduate population with mean =150 and standard deviation =30. Suppose also that there is a training program that increases a person's score on the English exam, and to demonstrate that, a random sample of 100 prospective exam takers receiving the training program and then taking the exam has the score mean = 155. Which of the following statements is correct?
   A. The claim that the training program can increase a person's score on the English exam is rejected at the one-tailed 0.05 level but accepted at the two-tailed 0.05 level.
   B. The degree of freedom for the test statistic is 99.
   C. The standard error of the mean is 3.
   D. The observed value of the test statistic is 5.
   E. The standard deviation of the sample mean is 30.

4. In what way would the result in Question 3 differ if only 65 trainees complete the training program, suppose that the sample mean does not change?
   A. The effect size would decrease.
   B. The power of the statistical test would increase.
   C. The probability of making a Type I error would decrease.
   D. The probability of making a Type II error would not change.
   E. The claim that the training program can increase a person's score on the English exam would be rejected at the 0.05 level.

5. If we measured data at the ordinal level of measurement from two dependent samples we should analyze the data with the
   A. Wilcoxon T test
   B. Mann-Whitney U test
   C. Chi-square test of independence
   D. Kruskal-Wallis H test
   E. Spearman's rho test

6. Suppose that s_1 is the standard deviation of a sample of size 15 that was drawn from a population whose mean and standard deviation are unknown. Further suppose that s_2 is the standard deviation of a sample of size 25 that was drawn from the sample population. Which of the following statements is true?
   A. s_1 is a better point-estimate of the population standard deviation than is s_2.
   B. s_2 is a better point-estimate of the population standard deviation than is s_1.
   C. The pooled variance is a better estimate of the population variance than is either s_1^2 or s_2^2
   D. Both A and C are true.
   E. Both B and C are true.

II. 填充題：每空格 4 分。請於答題卷上清楚標示各答案對應之空格編號，若無法辨認則不計分。

1. Suppose we are studying the effects of caffeine on cognitive performance. The following is the summary table for this study.

Source of Variation	Sum of square	df	Mean square	F	p
Dosage of Caffeine (D)	825.8	2	412.9	1.025	0.388
Gender of Participants (G)	434.1	1	434.1	1.079	0.319
D*G	2995.8	2	1497.9	3.721	0.055
error	4830.1	12	402.5		

A. The experimental design for this study is a ____(a)____ design.
B. How many participants are there in this study? ____(b)____
C. The "p" value stands for ____(c)____
D. If the distribution of the score of cognitive performance is not normally distributed, how should we analyze the data? ____(d)____

2. A researcher found that higher running speed is associated with higher resting heart rate, and he obtained the following summary table.

Source of Variation	Sum of square	df	Mean square	F	p
Regression	216.0	1	216.0	7.875	0.014
Residual	384.0	14	27.4		

A. The correlation between the running speed and resting heart rate is ____(e)____
B. How many participants are there in this study? ____(f)____
C. Assume that the sample variance of the resting heart rate is 10, the slope of the regression line would be ____(g)____, the covariance would be ____(h)____.

III.

一、何謂 standards for psychological testing？請舉例說明。(5%)
二、信度(reliability)的估計方法有那些？對速度測驗(speed tests)來說，應採用何種信度估計方法較合適？請說明原因。(15%)
三、何謂 predictive validity？請說明其在實務應用上的限制。(15%)
四、何謂 item response theory(IRT)？相較古典測驗理論，IRT 有那些優缺點。(15%)