國立臺北科技大學 100 學年度研究所博士班招生考試

系所組別：6100 技術及職業教育研究所

教育研究法與統計 試題

注意事項：

1. 本試題共分兩大部分，第一部份為教育研究法，第二部分為教育統計，配分共 100 分。
2. 請標明大題、子題編號，可用中文或英文作答(除非題目特別指定)，不必抄題。
3. 全部答案均須在答案卷之答案欄內作答，否則不予計分。

第一部份 教育研究法(60%)

I. Classify the following titles by the most appropriate research method (ie, Descriptive, Correlation, Causal-Comparative, Experimental, Historical, or Qualitative).(15%, 1.5% for each)

1. Relationship between creativity and achievement.
2. Effect of birth order on academic achievement.
3. Self-esteem of males versus females.
4. Attitudes of parents toward lowering the mandatory school attendance age from 16 to 14 years of age.
5. Relationship between time to run the 100-yard dash and high jumping performance.
6. Prediction of success in physics based on a physics aptitude test.
7. Effectiveness of daily homework with respect to achievement in Mathematics.
8. Attitudes of teachers toward school-based management.
9. Trends in reading methods, 1950-1990.
10. Comparative effectiveness of positive versus negative reinforcement with respect to absenteeism.

II. For the following hypotheses: (25%, 5% for each)

i. Identify the type of hypothesis (**Null hypothesis**, **Directional hypothesis**, **Nondirectional hypothesis,** or **N/A**=not a hypothesis).(1%)
ii. Identify the variables (if possible determine independent or dependent).(2%)
iii. Identify the classification of research study for each (by method, ie, Descriptive, Correlation, Causal-Comparative, Experimental, Historical, or Qualitative).(1%)
iv. Explain why that classification.(1%)

1. Shorter lunch periods result in reduced damage to school property.
2. Voluntary student enrollment in physics is not associated with type of physics program.
3. Bozo School District has an attendance problem in two of its high schools.
4. There will be a difference in student achievement in mathematics depending on the textbook they use.
5. Student achievement is positively related to the size of the school library.

III. 1) What are “Literature Review” and “Content Analysis”? (14%)
2) Please explain the difference between “Literature Review” and “Content Analysis”. (6%)

注意：背面尚有試題

第二部分：統計(40%)

一、是非題(20%，每題兩分，共 10 題)

(　)1.爲了儘量避免犯第一類型錯誤，把 α 值設定得更小，則犯第二類型錯誤的機率亦隨之減少。

(　)2.標準常態分配的標準差爲 1。

(　)3.常態分配時，平均數上下三個標準差的面積占總曲線面積的 90%。

(　)4.設母體變異已知，則抽樣數減少，信賴區間長度變大。

(　)5.只要母體比樣本大很多，則隨機樣本的統計量精確性與樣本大小無關。

(　)6.已知在 $\alpha=0.05$ 下拒絕虛無假設 H_0。在其他條件不變下，$\alpha=0.01$ 時亦拒絕該 H_0。

(　)7.當我們以樣本統計量來檢定假設時，第一類型錯誤與第二類型錯誤不可能同時發生。

(　)8.設有一檢定 H_0：$\mu_1=\mu_2$，若樣本數增加，且其他條件不變下，則 P-value 變小。

(　)9.在單因子變異數分析(ANOVA)中，殘差(residual)的變異量愈小，則檢定愈顯著。

(　)10.在迴歸分析中，若 $r^2=1$，則 SSE=0。

二、填充題(10%，每空格兩分，共五空格)

1.Part of the ANOVA table appears below:

Source	Degrees of freedom	Sum of squares	Mean squares	F
Groups	64	(A)	(B)	8
Error	(C)	(D)	2	
Total	100			

Then, (A)= _____ ; (B)=_____ ; (C)=_____ ; (D)=_____ .

2. A population that consists of 500 observations has a mean of 40 and a standard deviation of 15. A sample size 100 is taken at random from this population. The standard error of the sample mean equals: _____

三、簡答題(10%)

試舉例說明 Cluster Sampling 及 Stratified Random Sampling 的使用時機。