

國立中正大學 107 學年度碩士班招生考試試題
系所別：心理學系、心理學系臨床心理學 科目：心理與教育統計學

第 1 節

第 1 頁，共 4 頁

一、單選題(40%，每題 4 分)

1. How would you describe the following distribution?

Anxiety Rating	Frequency	Percent
1	25	35
2	26	37
3	14	20
4	5	7
5	1	1

- (A) Rectangular
- (B) Negatively skewed
- (C) Normal
- (D) With a floor effect

2. In the unit normal distribution, $z = -2$ is approximately the ____ percentile.

- (A) 2nd
- (B) 5th
- (C) 10th
- (D) 90th

3. According to the central limit theorem, the sampling distribution of the means will be narrower than the original population distribution by a factor of

- (A) sample size n
- (B) degree of freedom
- (C) \sqrt{n}
- (D) $\sqrt{(n-1)}$

4. According to the central limit theorem, If the population variance = 25 and the sample size = 16, then the standard error of the mean =

- (A) $\sqrt{1.67}$
- (B) 1.25
- (C) 6.25
- (D) 1.5625

5. When the population variance is known, a 95% confidence interval based on 400 subjects is most likely to be _____ a 95% confidence interval base on 100 subjects.

- (A) wider than
- (B) narrower than
- (C) the same width as
- (D) cannot be determined

6. The rejection region for a hypothesis test is
- (A) the region beyond the critical value(s)
 - (B) the standard error of the mean
 - (C) the difference between a Type I and a Type II error
 - (D) the region beyond the standard error(s)
7. Which of the following would cause an increase in statistical power?
- (A) The effect size becomes smaller
 - (B) Changing from a one-tailed to a two-tailed test
 - (C) Increasing the sample size
 - (D) Variability becomes larger
8. The appropriate test to determine the relationship between blood type (O, A, B, AB) and living area (urban, rural)
- (A) Pearson's r
 - (B) Spearman's r_s
 - (C) Chi-square goodness of fit test
 - (D) Chi-square test of independence
9. When the population variance is known, which of the following is most likely to increase statistical power without changing the critical value(s)?
- (A) Decrease the standard error of the mean
 - (B) Decrease the sample size
 - (C) Increase the sample size
 - (D) Increase the effect size
10. Given the following summary statistics for predicting Y from X: mean of X = 10, sum of squares (SS) for X = 5, mean of Y = 30, SS for Y = 10, correlation coefficient (r) between X and Y = 0.8, sample size = 42, what is the unbiased estimate for the standard error of the estimate r^2 ?
- (A) 0.3
 - (B) 0.207
 - (C) 0.212
 - (D) 0.4

二、問答題 (60%)

1. A researcher had collected data from an experimental group and a control group. What and why does the research need to do before performing an independent t test? (10%)

2. 中正大藥廠開發了一種止痛藥 X，並進行一項止痛藥 X 的藥效測試研究。中正大藥廠首先招募了 12 位主訴為慢性疼痛的一群研究參與者。所有研究參與者均在第一週服用止痛藥 X，並接著在第二週服用安慰劑。給予止痛藥 X 或安慰劑後，中正大藥廠均會以疼痛量表測量研究參與者的疼痛程度(總分 0~60 分，越高分表示疼痛程度越強烈)。疼痛測量結果如下所示：

第一週：30, 24, 22, 24, 24, 28, 28, 20, 28, 26, 20, 24
第二週：28, 26, 30, 28, 24, 60, 32, 22, 26, 28, 50, 28

- 中正大藥廠相信其自行投資開發的止痛藥 X 能夠有效降低疼痛程度。請問本藥物測試研究的虛無假設應為何？(3%)
- 承上，本研究的統計程序應採用單尾檢定或是雙尾檢定？理由為何？(3%)
- 承上，請以合適之統計程序考驗止痛藥 X 是否能夠有效降低疼痛程度。(8%)
- 承上，中正大藥廠的研究結論應為何？理由何在？(3%)
- 請問本研究有何重大缺陷？(3%)

3. 為了瞭解不同類型心理治療法對於治療憂鬱症的效果，阿華招募了三群憂鬱症患者，其中第一組施以心理分析治療，第二組施以完形治療，第三組則進行認知治療。經過為期八週且每週兩次的心理治療後，阿華施以自編憂鬱問卷(滿分 20，分數越高表示憂鬱程度越高)，用以測量三組憂鬱症患者的憂鬱情況。三組憂鬱症患者之憂鬱程度描述統計資料如下：

	心理分析治療	完形治療	認知治療
人數	10	10	10
平均數	19	17	15
不偏標準差	3.3	2.0	2.5

a. 請完成以下變異數分析摘要表(1)~(7) (請附計算過程，否則不予計分) (21%)：

Source	SS	Df	MS	F
Between Groups	(1)	(2)	(3)	(7)
Within Groups	(4)	(5)	(6)	
Total	(1)+(4)	(2)+(5)		

- 承上，請利用變異數分析摘要表與附錄二，完成假設考驗程序(hypothesis testing procedure)。(6%)
- 承上，阿華的研究結論應為何？理由何在？(3%)

附錄一：t 分配表

t 值	α				
	0.1	0.05	0.025	0.01	0.001
10	1.372	1.812	2.228	2.764	4.144
11	1.363	1.796	2.201	2.718	4.025
12	1.356	1.782	2.179	2.681	3.930
13	1.350	1.771	2.160	2.650	3.852
14	1.345	1.761	2.145	2.624	3.787
22	1.321	1.717	2.074	2.508	3.505
23	1.319	1.714	2.069	2.500	3.485
24	1.318	1.711	2.064	2.492	3.467
25	1.316	1.708	2.060	2.485	3.450
26	1.315	1.706	2.056	2.479	3.435

分母自由度

附錄二：F 分配表

$\alpha = .05$	分子自由度				
	1	2	3	4	5
20	4.351	3.493	3.098	2.866	2.711
21	4.325	3.467	3.072	2.840	2.685
22	4.301	3.443	3.049	2.817	2.661
23	4.279	3.422	3.028	2.796	2.640
24	4.260	3.403	3.009	2.776	2.621
25	4.242	3.385	2.991	2.759	2.603
26	4.225	3.369	2.975	2.743	2.587
27	4.210	3.354	2.960	2.728	2.572
28	4.196	3.340	2.947	2.714	2.558
29	4.183	3.328	2.934	2.701	2.545
30	4.171	3.316	2.922	2.690	2.534
40	4.085	3.232	2.839	2.606	2.449
50	4.034	3.183	2.790	2.557	2.400
60	4.001	3.150	2.758	2.525	2.368

分母自由度