國立臺北科技大學九十八學年度碩士班招生考試

系所組別：4300 資訊與運籌管理研究所不分組
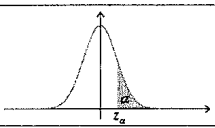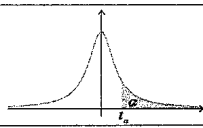
第二節　統計學　試題

Note:

注意事項：

1. 本試題共 12 題，配分共 100 分。
2. 請標明大題、子題編號作答，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。

	Standard Normal	t Distribution
	$z_{0.025} = 1.960$ $z_{0.05} = 1.645$	$t_{0.05}(9) = 1.833$ $t_{0.05}(8) = 1.860$ $t_{0.025}(9) = 2.262$ $t_{0.025}(8) = 2.306$

Question 1 to 8 is single choice, total is 40 points with each 5 points. Question 9 to 12 is calculation total 60 points.

1. (　　) The times that a sample of 9 bank customers waited in line where recorded and are listed here.

    7　4　0　2　7　3　1　9　12

    Determine the (mean, median, and mode) for these data.
    ①(5,7,4)②(7,4,5)③(4,5,7)④(5,4,7)

2. (　　) Examine the three samples listed here. Please indicate (which sample has the largest amount of variation, which sample has the smallest amount of variation).

    a.　17, 29, 12, 16, 11
    b.　22, 18, 23, 20, 17
    c.　24, 37, 6, 39, 29
    ①(a, b)②(c, a)③(c, b)④(b, a)

3. (　　) A set of data whose histogram is bell shaped yields a mean and standard deviation of 50 and 4, respectively. Approximately what proportion of observations are between 46 and 54?①68%②55%③95%④75%.

4. (　　) Determine whether each of the following is a valid probability distribution.

a.	x	0	1	2	3	else
	P(x)	.1	.3	.4	.1	0

b.	x	5	-6	10	0	else
	P(x)	.01	.01	.01	.97	0

c.	x	14	12	-7	13	else
	P(x)	.25	.46	.04	.24	0

    ①a②b③c④None of above.

5. (　　) If the standard error of the mean for the sampling distribution of random samples of size 36 from a large of infinite population is 2, how large must the size of the sample become if the standard error is to be reduced to 1.2?①25②81③100④49.

6. (　　) Which statements are true? (a) A decrease in type I error generally results in an increase in type II error. (b) Type I error can always be reduced by adjusting the critical value. (c) An increase in the sample size n will reduce type I error but increase type II error. (d) Power = 1- type II error. ①abcd②abd③abc④bcd.

7. (　　) The slope of linear regression Y to X has the same sign as (a) r_{xy} (b) S_{xy} (c) S_{xx} (d) S_{yy}. ①cd ②bd ③ad ④ab.

8. (　　) If the 95%confidence interval of μ is $-c < \mu < d$, $c, d > 0$, then we will conclude ① $H_0 : \mu = 0$ ② $H_0 : \mu \neq 0$ ③ $H_0 : \mu = d$ ④ $H_0 : \mu \neq d$.

9. Textbook publishers must estimate the sales of new (first-edition) books. The records of one major publishing company indicate that 10% of all new books sell more than projected, 30% sell close to the number projected, and 60% sell less than projected. Of those that sell more than projected, 70% are revised for a second edition, as are 50% of those that sell close to the number projected, and 20% of those that sell less than projected. What percentage of books published by this publishing company goes to a second edition? (10%)

10. According to the report, 7.0% of the population has lung disease. Of those having lung disease, 90.0% are smokers; of those not having lung disease, 25.3% are smokers. Determine the probability that a randomly selected smoker has lung disease. (10%)

11. Recent studies seem to indicate that using a cell phone while driving is dangerous. One reason for this is that a driver's reaction times may slow while he or she is talking on the phone. Researchers measured the reaction times of a sample of drives who owned a car phone. The sample n1=125 was tested while on the phone. The mean reaction time $\bar{x}_1$ and the standard deviation s_1 are 0.646 and 0.045 second, respectively. The sample n2=145 was tested not on the phone. The mean reaction time $\bar{x}_2$ and the standard deviation s_2 are 0.6 and 0.052 second, respectively. Can we conclude that reaction times are slower for drivers using cell phones? Significant level $\alpha = 0.05$. (Write down hypothesis, all the calculation and the final conclusion.) (20%)

12. The ANOVA Table is shown as following. (20%)

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Source	SS	df	MS	F
Treatment	803.0	4	200.8	(4)
Error	(1)	(2)	(3)	
Total	1360.2	29		

a. Fill the blank (1) to (4).   10%

b. What is null hypothesis of this ANOVA?   5%

c. Does ANOVA need same variance assumption? If it is, what is the estimation of the same variance of this question?   5%

CT2-2