



**STATISTICS 201**

**Final Exam**

June 6, 2003

Time= 1 hour 30 minutes

Aids allowed: Calculator, one formula sheet, Standard Normal Table, and Student-t table.

---

(Multiple choice) each question carries 10 points.

(1) The grade point average (GPA) of 7 randomly selected students from Statistics 210 class are:

3.14, 2.37, 2.94, 1.70, 3.60, 4.00, 1.85

(Summary calculations gave  $\sum x = 19.6$  and  $\sum x^2 = 59.39$ )

Then the sample standard deviation,  $s$ , is:

(a) 0.75 (b) 0.87 (c) 0.64 (d) 0.80 (e) none of the above

---

(2) The scores of a reference population on Wechsler Intelligence Scale for children (WISC) are normally distributed with mean 100 and standard deviation 5. What percent of this population have WISC scores between 95 and 110?

(a) 0.5000 (b) 0.6826 (c) 0.8185 (d) 0.9772 (e) none of the above.

---

(3) Refer to question (2). What score must a child achieve on the WISC in order to fall in the top 5%?

(a) 100.05 (b) 102.65 (c) 108.23 (d) 115.83 (e) none of the above

---

(4) A study is to be conducted to estimate the mean monthly fuel consumption expenditure per household vehicle. It is known from past experience that the monthly fuel consumption has a standard deviation of \$20 per vehicle. Determine the sample size  $n$  required to ensure that we can be 95% confident that the mean monthly fuel consumption expenditure is within \$0.50 of sample mean.

(a) 6147 (b) 6280 (c) 6500 (d) 6600 (e) none of the above

---

(5) The following table of data represents the sulphur concentration,  $x$ , in wine and the average taste score by judges:

x		0.3		0.5		0.6		0.7		0.8
-----										
y		55		65		75		70		85

What is the intercept  $b_0$  of the least squares regression line for the above table of data? (Summary calculations gave  $\sum X = 2.9$ ,  $\sum X^2 = 1.83$ ,  $\sum y = 350$ ,  $\sum y^2 = 25000$ , and  $\sum xy = 211$ )

(a) 2.90 (b) 38.65 (c) 54.05 (d) 70.00 (e) none of the above

---

Over →

(6) Refer to previous question. What percentage of variation in the y variable has been explained by the linear relationship?

- (a) 55% (b) 68% (c) 87% (d) 93% (e) none of the above
- 

(7) The scores of 18 females who have taken a qualifying test are:

101, 103, 109, 115, 126, 126, 129, 137, 137, 140, 148, 152, 154, 154, 165, 165, 178, 200

Which of the following statements is true?

- (a) There are no outliers in the above data  
(b) 101 is the only outlying observation  
(c) 200 is the only outlying observation  
(d) 101 and 200 are both outliers
- 

(8) Acid rain appears to be a growing problem in the North-Western section of Lebanon. Pure rain falling through clean air registers a pH value of 5.7 (pH is a measure of acidity; 0 is acid, 14 is alkaline). Suppose samples of rainfall were collected from 4 different locations in the northwest of Lebanon and analyzed for pH level. The results gave a mean of 3.7 and a sample standard deviation  $s = 0.5$ . Assume the pH level follow the normal distribution. Determine the margin of error for 99% confidence level.

- (a) 0.32 (b) 0.64 (c) 0.73 (d) 1.46 (e) none of the above
- 

(9) Refer to previous question (8). An environmentalist is convinced that he has got evidence to show that acid rain has become significantly lower than the pure rain in the North-Western part of Lebanon. He formulates a hypothesis to test his claim at the  $\alpha = 1\%$  significance level. Then the hypothesis that asserts his claim is

- (a)  $H_0 : \mu = 5.7$  vs  $H_a : \mu > 5.7$   
(b)  $H_0 : \mu = 5.7$  vs  $H_a : \mu < 5.7$   
(c)  $H_0 : \mu = 5.7$  vs  $H_a : \mu \neq 5.7$   
(d)  $H_0 : \mu = 3.7$  vs  $H_a : \mu \neq 3.7$   
(e) none of the above
- 

(10) A 95% confidence interval for the mean reading achievement scores for a population of third grade students is (44.2, 54.2). Then the margin of error of this interval is

- (a) 95% (b) 5 (c) 10 (d) 54.2 (e) none of the above
- 
-