

Exam 2 – college essay



**ASSIGN
BUSTER**

Exam 2 PUBH 600 Guidelines: You may use all of the resources (e. g. , textbook, other books, websites) available to you, EXCEPT FOR OTHER PEOPLE. Your work must be done individually. Any exams that appear similar in format and/or answers will be considered to have been done in a group setting. All such exams will receive a score of 0. Late exams will not be accepted for any reason. Any late exams will receive a score of 0. These policies will be strictly enforced. Remember that your exam must be typed in a Word document. Do not save your work as Word 2007.

The exam can either be submitted as an attachment through WebCT or a hardcopy can be submitted to me in my office before 5: 00 pm on November 20. Completed exams will be accepted at any time until the deadline. Each question is worth 10 points. 1. Suppose the distribution of serum cholesterol values in undergraduate men is approximately normal with mean (μ = 190 mg/dl and standard deviation (σ = 40 mg/dl. a. What is the probability of selecting someone at random from this population who has a cholesterol value that is less than 180? [pic] b.

You take a simple random sample of $n = 49$ individuals from this population and calculate the mean cholesterol of the sample. Describe the sampling distribution of \bar{x} . The standard deviation of the sampling distribution of \bar{x} is called the SE and is = [pic] c. Regarding the mean derived from a sample of $n = 49$, what is the probability of getting a sample mean that is less than 180? [Determine $\Pr(\bar{x} < 180)$]. [pic] 2. Based on prior studies, a dental researcher is willing to assume that the standard deviation of the weekly sugar consumption in children in a particular community is 100 grams.

How large a sample is needed to estimate mean sugar consumption in the community with a margin of error 10 grams at 95%? [pic] 3. Based on prior studies, a dental researcher is willing to assume that the standard deviation of the weekly sugar consumption in children in a particular community is 100 grams. How many kids should be studied if the researcher is willing to accept a margin of error of 25 grams at 95%? [pic] 4. The manufacturer of a laboratory scale claims their scale is accurate to within 0.0015 gram.

You read the documentation for the scale and learn that this means that the standard deviation of an individual measurement (σ) is equal to 0.0015 grams. Assume measurements vary according to a normal distribution with μ equal to the actual weight of the object. You weigh the same specimen twice and get readings of 24.31 grams and 24.34 grams. Based on this information, calculate a 95% confidence interval for the true weight of the object. [pic] 5. The 95% confidence interval for the mean weight of infants born to mothers who smoke is 5.7 to 6.5 pounds.

The mean weight for all newborns in this region is 7.2 pounds. Is the birth weight of the infants in this sample significantly different from that of the general population at $\alpha = 0.05$? Explain your response. Sample mean is the center of the confidence interval $\bar{x} =$ [pic] A 95% confidence interval corresponds to $\alpha = 0.05$ Therefore, if the 95% CI for [pic] = 6.1 = 5.7 to 6.5 pounds, the sample mean is significantly different because it excludes 7.2 pounds. 6. The placebo effect occurs when a patient experiences a perceived benefit after receiving an inert substance.

To help understand the mechanism behind this phenomenon in Parkinson's disease patients, investigators measured striatal RAC binding at a key point in the brains in six subjects. RAC binding was reduced by an average of 0.326 units (dbar) on a placebo in the six subjects (sd = 0.181). Test this difference for statistical significance. [pic] 7. The calcium content values in a sample of $n = 5$ sound teeth (% calcium) are {33.4, 36.2, 34.8, 35.2, 35.5}. Provide a 99% confidence interval for μ . (Assume the data are an SRS). [pic] 8.

Body weight expressed as a percentage of ideal in an SRS of $n = 9$ girls selected at random are as follows {114, 100, 104, 94, 114, 105, 103, 105, 96}. Calculate a 95% confidence interval for the population mean μ . [pic] 9.

Health care workers are at risk of being exposed to blood-borne pathogens through needle-stick and other sharp object injuries. The pathogens of primary concern are the human immunodeficiency virus, hepatitis B virus, and hepatitis C virus. When a needle-stick injury occurs, workers report the incident to their supervisor.

This information is forwarded to county health departments and ultimately to the Centers for Disease Control and Prevention (CDC). A CDC researcher used these data to compare needle-stick injuries in community hospitals and tertiary-care hospitals. Is this a paired or independent comparison? Explain your answer. Paired comparisons may be from one individual - before and after samples - or from different individuals who have been matched for some characteristic, e. g. sex, age, height etc. In this question, we are looking at "healthcare workers".

The needle-stick observations of healthcare workers share a link that makes them similar to one another and allows the researcher to “compare” needle-stick injuries in various settings, e. g. “all healthcare facilities” including in community and tertiary-care hospitals. 10. A study measures total histidine excretion (milligrams) in 24-hour urine samples in men and women on protein-restricted diets. The histidine values (mg) for men are {172, 204, 229, 236, 256}. The values for women are {115, 135, 138, 174, 197, 224}.

Determine if there is a difference between the mean values for the men and women. | MEAN | STD DEV | | MEN | 219. 4 | 32. 37 | | WOMEN | 163. 833 |

41. 73 | | | | [pic] 11. Severe anxiety often accompanies patients who must undergo chronic hemodialysis. A study was undertaken to determine the effects of a set of progressive relaxation exercises on anxiety in hemodialysis patients. The treatment group consisted of 38 subjects who were shown a set of progressive relaxation videotapes. The control group was made up of 23 patients shown a set of neutral videotapes.

A psychiatric questionnaire that measured anxiety revealed the test results below. Test for a difference between the treatment and control groups. |

Group | n | mean | std dev | | Experimental | 38 | 33. 42 | 10. 18 | | Control | 23 | 39. 71 | 9. 16 | [pic] [http://www. dimensionresearch.](http://www.dimensionresearch.com/resources/calculators/ttest.tml)

[com/resources/calculators/ttest. tml](http://www.dimensionresearch.com/resources/calculators/ttest.tml) Obtained from the website above - plugged in hemodialysis patients data from table above. [pic] $TS = 2. 4265$ $df = 59$ (Not sure how to get the Critical Value at 59 degrees of freedom from text book) t table = Numbers go through 40 - then jumps to 60. [pic] # 12

ATTACHED 12. The ubiquity of junk food may contribute to the high prevalence of obesity in western societies. Below is the data from a study of

weight gain over a 1-month period in lab mice. Determine if there is a difference in mean weight gain. If there is a difference perform both a Fisher's LSD and a Tukey's HSD to determine which pairs are different.

Group 1 | Group 2 | Group 3 | |(Standard) |(Junk Food) |(Organic) | | 9. 09 | 10. 21 | 9. 03 | | 9. 96 | 10. 48 | 9. 55 | | 9. 72 | 13. 01 12. 35 | | 9. 64 | 12. 74 | 9. 33 | | 8. 14 | 12. 58 | 9. 51 | 13. In a length of hospitalization study conducted by several cooperating hospitals, a random sample of 64 peptic ulcer patients were drawn from a list of all peptic ulcer patients ever admitted to the participating hospitals and the length of hospitalization per admission was determined for each.

The mean length of hospitalization was found to be 8. 25 days with a standard deviation of 3 days. Construct 90, 95, and 99 percent confidence intervals for the population mean. [pic] 14. The dean of a large college is concerned that the students' grade-point averages have changed dramatically in recent years. The graduating seniors' mean GPA over the past 5 years is 2. 75. The dean randomly samples 30 seniors from the last graduating class and finds that their mean GPA is 2. 85, with a standard deviation of 0. 65. Test the null hypothesis that the mean GPA for the graduating seniors is 2. 75 (i. e. $H_0: \mu = 2.75$). [pic] # 15 ATTACHED 15. A sociologist is interested in whether or not level of parental occupation affects anxiety scores among ninth-grade students. The data below are scores on a standardized anxiety test for students with parents in three different occupational levels. Determine if there is a difference in the population means and then use Fisher's LSD and Tukey's HSD to test for significant differences between the individual pairs of means. | Q15 | | | | | | | |

Occupational Level ||||| Group 1 | Group 2 | Group 3 ||||| 8 | 23 | 21
 ||||| 6 | 11 | 21 ||||| 4 | 17 | 22 ||||| 12 | 16 | 18 ||||| 16 | 6 |
 14 ||||| 17 | 14 | 21 ||||| 12 | 15 | 9 ||||| 10 | 19 | 11 ||||| 11
 | 10 ||||| 13 | | ||||| TOTALS | 109 | 131 | 137 | ||||| XBAR | 10. 9 |
 14. 5556 | 17. 125 | 14. 935 ||||| Anova: Single
 Factor ||||| SUMMARY ||||| Groups | Count | Sum |
 Average | Variance ||||| Group 1 | 10 | 109 | 10. 9 | 16. 76667 ||||| Group
 2 | 9 | 131 | 14. 55556 | 25. 77778 ||||| Group 3 | 8 | 137 | 17. 125 | 26. 25 |
 ||||| ANOVA ||||| Source of Variation | SS | df |
 MS | F | P-value | F crit | | Between Groups | 176. 96574 | 2 | 88. 48287 | 3.
 932592 | 0. 033323 | 3. 402832 | | Total | 716. 6296 | 26 | | | |||||
 ||||| BONUS (10 Points): One of the
 purposes of a study by Blum et al. was to determine the pharmacokinetics of
 phenytoin in the presence and absence of concomitant fluconazole therapy
 {Blum RA, Wilton JH, Hilligoss DM, Gardner MJ, Henry EB, Harrison NJ,
 Schentag JJ.

Effect of fluconazole on the disposition of phenytoin. *Clinical Pharmacology and Therapeutics* 1991; 49: 420-425}. Among the data collected during the course of the study were the following serum concentrations of fluconazole for 10 healthy male subjects at three different points in time. Determine if there is a difference in fluconazole levels over time (HINT: this is a repeated measures ANOVA).

Subject	Day 14	Day 18	Day 21
001	8. 28	9. 55	11. 1
004	4. 71	5. 05	5. 20
005	9. 48	11. 33	8. 45
007	6. 04	8. 08	8. 42
008	6. 02	6. 32	6. 93
012	7. 4	7. 44	8. 12
013	5. 86	6. 19	5. 98
016	6. 08	6. 03	6. 45
017	7. 50	8. 04	

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6. 26 | | 020 | 4. 92 | 5. 28 | 6. 7 | | BONUS QUESTION | | | | | | | | | | | | | | | | |
SUBJECT | DAY 14 | DAY 18 | DAY 21 | | | | 001 | 8. 28 | 9. 55 | 11. 21 | | | | |
004 | 4. 71 | 5. 05 | 5. 2 | | | | 005 | 9. 48 | 11. 33 | 8. 5 | | | | 007 | 6. 04 | 8.
08 | 8. 42 | | | | 008 | 6. 02 | 6. 32 | 6. 93 | | | | 012 | 7. 34 | 7. 44 | 8. 12 | | |
| | 013 | 5. 86 | 6. 19 | 5. 98 | | | | 016 | 6. 08 | 6. 03 | 6. 45 | | | | 017 | 7. 5 |
8. 04 | 6. 6 | | | | 020 | 4. 92 | 5. 28 | 6. 17 | | | | | | | | | | Anova: Two-
Factor Without Replication | | | | | | | | | | | | | | | SUMMARY | Count | Sum |
Average | Variance | | | | 001 | 3 | 29. 04 | 9. 68 | 2. 589 | | | | 004 | 3 | 14. 96
| 4. 986667 | 0. 063033 | | | | 005 | 3 | 29. 26 | 9. 753333 | 2. 129633 | | | |
007 | 3 | 22. 54 | 7. 513333 | 1. 656933 | | | | 008 | 3 | 19. 27 | 6. 423333 | 0.
215033 | | | | 012 | 3 | 22. 9 | 7. 633333 | 0. 180133 | | | | 013 | 3 | 18. 03 | 6.
01 | 0. 279 | | | | 016 | 3 | 18. 56 | 6. 186667 | 0. 052633 | | | | 017 | 3 | 21. 8 |
7. 266667 | 0. 832933 | | | | 020 | 3 | 16. 37 | 5. 456667 | 0. 414033 | | | | | |
| | | | | DAY 14 | 10 | 66. 23 | 6. 623 | 2. 259068 | | | | DAY 18 | 10 | 73. 31 | 7.
31 | 3. 935299 | | | | DAY 21 | 10 | 73. 19 | 7. 319 | 3. 100454 | | | | | | | | | |
| | | | | ANOVA | | | | | | | Source of Variation | SS | df | MS | F | P-value | F
crit | | Rows | 71. 7714 | 9 | 7. 941904 | 11. 74042 | 7. 28E-06 | 2. 456282 | |
Columns | 3. 28608 | 2 | 1. 64304 | 2. 428885 | 0. 116452 | 3. 554561 | | | | | |
| | | | Total | 86. 93947 | 29 | | | | | | | | | | | | | | | |

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