American University of Beirut
STAT 201
Elementary Statistics
Fall 2005-2006

Final Exam

Name: ....   ID #:   ....

good luck

1. Which is the following descriptive measures can never be negative ?

   A. mean   B. variance   C. Q_2 D. mode   E. none of the above

2. In the Beirut city 10 km run, there was 12000 participants from which 6769 are men and 5231 are women. Then which of the following measures of the center is the most appropriate to use ?

   A. mean   B. median   C. Q_1 D. mode   E. none of the above

3. The age of 10 selected babies were recorded as follows. (Summary calculations gave $\sum x = 34, \sum x^2 = 128$)

1	4	3	4	2
5	4	4	3	4

   What are the mean and the sample standard deviation?

   A. 3.4 & 1.17   B. 1.7 & 0.18   C. 2.16 & -1.2   D. 3.4 & 1.67   E. none of the above

4. Which of the following values cannot be probability of events

   A. 1/5   B. 0.97   C. 4/3   D. 0   E. none of the above

5. Two mutually exclusive events:

   i) have the same probability

   ii) cannot occur together

   iii) have no effect on each other

   iv) can have outcome in common

   A. i)   B. ii)   C. iii)   D. iv)   E. none of the above

6. The scores of the Graduate Record Examination (GRE) are normally distributed with mean 500 and standard deviation 100. Chester, who has taken the GRE exam, was told that his score was among the top 5%. Then Chester's score was greater than

   A. 400.5   B. 500.5   C. 644.5   D. 664.5   E. none of the above

7. Assume the fill amount of liquid in a soda bottle has a normal distribution with mean 375 ml, and a unknown standard deviation σ. What is the value of σ if experience has shown that only 1% of the bottles have fill that exceed 376 ml ?

    A. 0.13   B. 0.23   C. 0.33   D. 0.43   E. none of the above

8. The time a person spends at an art exhibit is normally distributed with a mean of 62 minutes and a standard deviation of 12 minutes. If a sample of 16 visitors are chosen on a particular day. What is the probability that the average time they spend is less than 65 minutes

    A. 0.1587   B. 0.8413   C. 0.5987   D. 0.4013   E. none of the above

9. The heights of American men aged 18 years are normally distributed with mean 170 cm and standard deviation 10 cm. Only about 5% of American men aged 18 years have heights outside the range

    A. [140.6; 190.4]   B. [160; 180]   C. [150.4; 189.6]   D. [165; 175]   E. none

10. A laboratory tested 12 chicken eggs and found that the mean amount of cholesterol was 230 milligrams. Construct a 95% confidence interval for the mean cholesterol contents of all such eggs. Assume the population is normally distributed, with $\sigma = 14.3$.

    A. [220.9;238.1]   B. [221.9;239.3]   C. [220.9;239.3]   D. [221.9;238.1]   E. none of the above

11. You have measured the systolic blood pressure of a random sample of 36 employees of a company located near you. A 99% confidence interval for μ, the mean systolic blood pressure for the employees of this company is [122;138]. Which of the following statements gives a valid interpretation of this interval

i) If the procedure were repeated 100 times, 99 of the resulting confidence intervals would contain μ, the population mean systolic blood pressure.

ii) 99% of the sample of employees have a systolic blood pressure between 122 and 138

iii) 99% of the population employees have a systolic blood pressure between 122 and 138

iv) If the procedure were repeated 100 times, 99 of the resulting sample means would be between 122 and 138.

    A. i)   B. ii)   C. iii)   D. iv)   E. none of the above

12. You want to test the Null hypothesis $H_0 : \mu = 70$ vs. $H_a : \mu \neq 70$ at $\alpha = 0.05$, and you have calculated the 95% confidence interval of μ and found that its limits are 65 and 75. Based on this information you:

i) conclude that H_0 will be rejected

ii) conclude that H_0 will not be rejected

iii) need to know the sample size to conclude

iv) the confidence interval and testing hypothesis are not related

    A. i)   B. ii)   C. iii)   D. iv)   E. none of the above

13. When the value of α increases, the probability of committing

i) type I error increases

ii) type I error decreases

iii) type I error remains the same

iv) has nothing to do with type I error

      A. i)   B. ii)   C. iii)   D. iv)   E. none of the above

14. A statistician claims that the average age of people who buy a lottery ticket is 60 years. A random sample of 36 people is selected and their mean age was found to be 58 years, with a sample standard deviation of 6 years. To test whether the age found is different than the age claimed by the statistician we should conduct

i) a two-sided z-test

ii) a two-sided t-test

iii) a one-sided z-test

iv) a one-sided t-test

      A. i)   B. ii)   C. iii)   D. iv)   E. none of the above

15. In the past, the mean running time for a certain type of flashlight battery has been 9.8 hours. The manufacturer has introduced a change in production method and want to perform a test to determine if the mean running time has increased as a result. A randomly selected sample of 30 batteries yields a mean running time of 10.2 hours. Assume the population standard deviation of 1.3 hours. Then at 10% significance level:

i) H_0 is accepted.

ii) we don't have enough evidence against H_0.

iii) we are undecided.

iv) there is enough evidence to support the claim that the mean running time of all light bulbs has increased from the previous mean of 9.8 hours.

      A. i)   B. ii)   C. iii)   D. iv)   E. none of the above

16. *(bonus 2 points)* STAT 201 was FUN?

      A. *true*   B. **false**   C. none of the above