KING FAHD UNIVERSITY OF PETROLEUM & MINERALS
DEPARTMENT OF MATHEMATICS & STATISTICS
STAT 319.05 Quiz # 4

Name: _____ ID #: _____

1) The elasticity of a polymer is affected by the concentration of a reactant. When a low concentration is used, the true mean elasticity is 55, with a standard deviation of 6.
   a) In a random sample of size 16, what is the probability that the sample mean is between 53 and 57, assuming that the concentration of reactant has a normal distribution.

   b) What if the distribution of the reactant is not normal? What do you suggest?

2) The brightness of a television picture can be evaluated by measuring the amount of current required to achieve a particular brightness level. A sample of 15 tubes results in a mean current of 311 and standard deviation of 16.
   a) Construct a 95 % confidence interval for the mean current.

   b) Interpret the interval.

   c) Do you need to make any assumptions? If yes, what?

3) The life in hours of a 75-watt bulb has a standard deviation of 20 hours. A random sample of 30 bulbs has a mean life of 1014 hours.
   a) Construct a 95% confidence interval for the mean life of such bulbs.

   b) Do you need to make any assumptions? If yes, what?

   c) By how much must the sample size be increased if the length of the confidence interval above is to be cut in half?

4) A new rocket launching system is being considered for deployment. The existing system has a probability of successful launch of 0.8. 40 experimental launches of the new system had 34 successful ones.
   a) Construct a 95% confidence interval for the probability of a successful launch of the new system.

   b) Would you conclude that the new system is better? Explain.