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| **19.** Consider two population distributions labeled X and Y. Distribution X is highly skewed while the distribution Y is slightly skewed. In order for the sampling distributions of X and Y to achieve the same degree of normality: (Ch7) (Points : 7) |

 Population Y will require a larger sample size  
       Population X will require a larger sample size  
       Population X and Y will require the same sample size  
       None of the above

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| **20.** Health insurers and the federal government are both putting pressure on hospitals to shorten the average length of stay (LOS) of their patients.  A random sample of 16 hospitals in one state had a mean LOS for non-heart patients in 2000 of 5 days and a standard deviation of 2 days. Calculate a 95% confidence interval for the population mean LOS for non-heart patients in the state's hospitals in 2000. (Ch8) (Points : 7) |

 [4.02 5.98]  
       [3.93 6.07]  
       [4.18 5.82]  
       [3.52 6.47]  
       [3.71 6.29]

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| **21.** In a manufacturing process a random sample of 9 bolts is taken which gives a mean length of 3 inches with a variance of .09. What is the 90% confidence interval for the true mean length of the bolt? (Ch8)  (Points : 7) |

 2.8355 to 3.1645  
       2.5065 to 3.4935  
       2.4420 to 3.5580  
       2.8140 to 3.1860  
       2.9442 to 3.0558

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| **25.** In a manufacturing process a machine produces bolts that have an average length of 3 inches with a variance of .03. If we randomly select three bolts from this process: What is the standard deviation of the sampling distribution of the sample mean? (Ch7)  (Points : 7) |

 0.03  
       0.01  
       0.1732  
       0.0577  
       0.10

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| **33.** The internal auditing staff of a local manufacturing company performs a sample audit each quarter to estimate the proportion of accounts that are delinquent more than 90 days overdue. The historical records of the company show that over the past 8 years 14 percent of the accounts are delinquent. For this quarter, the auditing staff randomly selected 250 customer accounts. What is the probability that at least 30 accounts will be classified as delinquent? (Ch 6)  (Points : 7) |

 31.86%  
       18.14%  
  
  
       81.86%  
       63.72%  
       75.84%

**Essay type questions**  
**40.** The lifetime of a disk drive head is normally distributed with a population mean of 1000 hours and a standard deviation of 120 hours. Determine the probability that the average lifetime for 16 disk drives will exceed 940 hours.

**41.** A small town has a population of 15,000 people.  Among these 1,000 regularly visit a popular local bar. A sample of 121 people who visit the bar is surveyed for their annual expenditures in the bar. It is found that on average each person who regularly visits the bar spends about $2500 per year in the bar with a standard deviation of $196. Construct a 95 percent confidence interval around the mean annual expenditure in the bar.

42. The number of items rejected daily by a manufacturer because of defects for the last 30 days are: 20, 21, 8, 17, 22, 19, 18, 19, 14, 17, 11, 6, 21, 25, 4, 18, 8, 12, 16, 16, 10, 28, 24, 6, 21, 20, 23, 5, 17, 8 . Complete this frequency table for the above data (note that the class intervals exclude the upper boundaries):   
  
                  Frequency   Rel. Freq      Cum. Rel. Freq  
4<9  
9<14  
14<19  
19<24  
24<29