BSSE 13th Batch First Year Second Semester First Midterm Examination

Course – STAT 203; Time – 1 hour; Full Marks – 20

Answer all the questions.

1. The mean breaking strength of a certain type of fiber is required to be at least 200 psi. A sample of 8 pieces of fiber yielded breakage at the following pressures:

   210, 198, 195, 202, 197.4, 196, 199, 195.5.

   Would you conclude, at the 5 percent level of significance, that the mean breaking strength of the fiber is less than the target?

2. A pharmaceutical house produces a certain drug item whose weight has a standard deviation of 0.4 mg. The company's research team has proposed a new method of producing the drug which will be adopted only if there is strong evidence that the standard deviation of the weight of the items will decrease. If a sample of 10 items is produced and has the following weights (mg), should the new method be adopted?

   5.28, 5.31, 5.22, 5.19, 5.27, 5.24, 5.18, 5.26, 5.23, 5.22

3. You think that the mean distance flown by female bats between feedings is more than that of male bats. To study this, you have studied a random sample of 12 female and 10 male bats. For female bats, the sample mean and the sample SD are 180 and 92, respectively. For male bats, the sample mean and the sample SD are 136 and 86, respectively. What is your conclusion?

4. The following data represent the relationship between the number of alignment errors (y) and the number of missing rivets (x) for 5 different aircraft.

Number of missing rivets:	10	15	20	25	30
Number of alignment errors:	5	7	11	12	15

   a. Fit a linear relation.
   b. Estimate the error variance.