Problems for TA session 18th October:-

8. An electric scale gives a reading equal to the true weight plus a random error that is normally distributed with mean 0 and standard deviation $\sigma = .1$ mg. Suppose that the results of five successive weighings of the same object are as follows: 3.142, 3.163, 3.155, 3.150, 3.141.

(a) Determine a 95 percent confidence interval estimate of the true weight.
(b) Determine a 99 percent confidence interval estimate of the true weight.

13. A sample of 20 cigarettes is tested to determine nicotine content and the average value observed was 1.2 mg. Compute a 99 percent two-sided confidence interval for the mean nicotine content of a cigarette if it is known that the standard deviation of a cigarette's nicotine content is $\sigma = .2$ mg.

14. In Problem 13, suppose that the population variance is not known in advance of the experiment. If the sample variance is .04, compute a 99 percent two-sided confidence interval for the mean nicotine content.

36. The capacities (in ampere-hours) of 10 batteries were recorded as follows:

$$140, 136, 150, 144, 148, 152, 138, 141, 143, 151$$

(a) Estimate the population variance σ^2.
(b) Compute a 99 percent two-sided confidence interval for σ^2.
(c) Compute a value v that enables us to state, with 90 percent confidence, that σ^2 is less than v.