1. Answer the following questions (**any four**)   2 x 4= 8

(a) What do you mean by 'Type-II error'?

                    or

   Define level of significance in hypothesis testing.

(b) Define bias of an estimator.

(c) Write down the characteristic properties of F-distribution.

(d) What is meant by the sampling fluctuation of a statistic? How is it measured?

                    or

   Discuss the advantages of sampling over complete enumeration.

(e) If X_1, X_2 and X_3 is a random sample of size 3 from a population with mean value μ. If $T_1 = X_1 + X_2 - X_3$ and $T_2 = 2X_1 + 3X_3 - 4X_2$, are T_1 and T_2 unbiased estimators?

2. Answer the following questions (**any three**)   14 x 3= 42

a. (i) Write down the criteria of good index number.

   (ii) If t be a unbiased estimator of Θ, show that, in general, t^2 is a biased estimator of Θ^2.

   (iii) What do you mean by confidence interval? Find the confidence limits for difference of means in case of large sample test.   2+4+2+6

b. (i) A sample of 100 gave a mean of 7.4 kg and a standard deviation of 1.2 kg. Find 95% confidence limits for the population mean.

   (ii) What do you mean by parameter and statistic?

   (iii) Find the maximum likelihood estimator of Normal distribution when both mean and variance are unknown.   4+4+6

c. (i) Distinguish between process control and lot control used in statistical quality control.

(iii) Write down the simplest method of measuring seasonal variations in a time series analysis. What are the merits and demerits of this method?

(iii) Write down the properties of maximum likelihood estimator. 3+6+5

d.(i) What do you mean by crude death rate and standardised death rate?

(ii) Write down the construction of a life table. 7+7