FACULTY OF SCIENCE
B.Sc. (CBCS) III-Year (V-Semester) Regular Examinations, Dec-2022/Jan-2023
Statistics-V/A
(Applied Statistics-I)

Time: 3 Hours   Max Marks: 80

SECTION-A   (4x5=20 Marks)
Answer any Four questions from the following

1.   Define the following terms?
        (a) Population   (b) Sample   (c) sample frame.

2.   Define proportional allocation. And list the methods of allocating a sample in stratified random sampling.

3.   What is time series and write it's components?

4.   Explain the importance of SQC in industry.

5.   Explain sampling errors.

6.   Explain 'Six sigma' importance.

SECTION-B   (4x15=60 Marks)
Answer all the following questions

7.   (a) Explain the principal steps in a sample survey.
                (OR)
        (b) Distinguish between SRSWOR and SRSWR. Show that sample mean square is an unbiased estimate of population mean square.

8.   (a) If the population consists linear trend then prove that

$$\text{Var}\left(\bar{Y}\,st\right) \le \text{Var}\left(\bar{Y}\,sys\right) \le \text{Var}\left(\bar{Y}\,n\right)\text{ran.}$$

                (OR)

        (b) In Neyman allocation of stratified random sampling prove that $\text{Var}\left(\bar{Y}\,st\right)$ is

        minimum for fixed total sample size n if $n_i \propto N_i S_i$.

9.   (a) Explain the fitting of a modified exponential curve and Gompertz curve to a time series data.
                (OR)
        (b) Explain link relatives procedure for determination of seasonal Indices.

10.   (a) Explain the construction of R and S.d. charts in detail and what purpose they serve.
                (OR)
        (b) Explain,
                (i) The control charts for number of defects per unit and
                (ii) Control charts for number of defects for variable sample size.