CLASS: XII

SUBJECT : STATISTICS (STAT)

COURSE CODE: PRACTICAL

FULL MARKS: 30 **CONTACT HOURS: 80**

PROBLEMS FOR PRACTICAL EXAMINATION: 18 (5×2+4×2)

LABORATORY NOTE BOOK : 04, PROJECT WORKS : 05, VIVA-VOCE : 03

List of Problem Sets :

1. Scatter Diagram, Calculation of Correlation Coefficient and Regression Coefficient, Identifying the Regression Equations, Finding the Regression Equations from Bivariate Data, Problems on Spearman's Rank Correlation Coefficient (case of no tie).
2. Application and Fitting of Binomial, Poisson and Normal Distributions.
3. Drawing of Random Samples in SRSWR and SRSWOR using Random Number Tables.
4. Sampling Distribution of Sample Mean from a Finite Population based on SRSWR and SRSWOR (Start with a population having a finite number of values (4, 5, 6 etc.); choose a sample size of 2, 3 etc.; list all possible samples of the chosen size; calculate sample mean based on each such sample; obtain the sampling distribution of the sample mean and display this distribution diagrammatically).
5. Estimation of Population Mean and Standard Error of the Estimator of Population Mean under SRSWR and SRSWOR.
6. Testing of Hypothesis in case of Poisson Parameter, Mean and Variance of Normal Distribution, χ^2 goodness of fit.
7. Determination of Trend in Time Series Data using Moving Average Method (period of moving average even and odd), Linear trend equation and Exponential trend equation.
8. Construction of Control Chart (p, np, $\bar{x}$, R)
9. **Project Works :**

   Here, we propose some mini-projects :

   (a) Collect the marks obtained in Test Examination and in Final Examination in MP for the students of a year. Plot the data to obtain a scatter diagram showing the relation between these two sets of scores. Calculate Correlation Coefficient and also obtain the Regression Lines. Estimate Final score based on Test score for the students. Compare estimated scores and actual scores. Are they same? If not, then what is the interpretation of it? Explain this in the conclusion of your project report.

   (b) Collect data on heights (in inches) and weights (in kg) of a group of students of same gender and same age group. Draw the scatter diagram of these bivariate data. Calculate correlation coefficient and then compute the regression equations of both the types.

   (c) Collect data on age of father and mother of a group of your friends. Rank the data. Using ranked data, calculate Rank Correlation Coefficient. Comment on the result you obtained.

(d) Collect the maximum daily temperature (℃) and minimum daily temperature (℃) of your city from weather report for consecutive 30 days. Then plot the data using a suitable scale. Comment on the nature of the data you obtained.

(e) Purchase 10 different chocolates from a nearby shop. Ask your two friends separately to rank them according to their preference. Using these data, check whether their preferences are related or not.

(f) From a group of students of a class select a sample of size 10 using Random Number Table by SRSWR and SRSWOR. Estimate sample mean and sample variance based on the result you obtained.

(g) Collect the data on the movement of BSE SENSEX for last two weeks. Fit a linear trend to the data and calculate the predicted value for next two days. Verify the correctness of the predicted values with the actual values. Comment on the result you obtained.

INSTRUCTIONS for Laboratory Session and

Preparation of Laboratory Note Book for STATISTICS.

1. For Laboratory Note Book, square sheets and white sheets both are to be used by the students, but if the square sheets are not available then the students may use Laboratory Note Book as used in practical of Biological Sciences, Physics and Chemistry etc.

2. Strictly, HB pencil is to be used in laboratory sessions. Scientific calculators (Non-Programmable) may be used. If required, Statistical Tables are to be supplied by the institutions. Geometry Box may also be used.

3. A problem set on a specific topic covering different numerical problems based on Secondary data is to be supplied to the students in a laboratory session. This may be typed or printed or neatly hand-written in white papers.

   Each problem set should carry at the top

   (a) The problem set number

   (b) Heading (in capital letters)

   (c) Working date

4. While solving any problem in any of the problem sets, students must mention the necessary theory along with relevant formula and notations, in brief, wherever and whenever needed in the square sheets. No derivation or discussion is needed. Use tables for showing the calculations.

5. The necessary calculations are to be shown stepwise with specification of units, wherever required. Calculations should be presented neatly, whenever required, in a square sheet or in the ruled side of the inter-leaf sheet.

6. For graphs and diagrams the cm/mm graph papers are to be used. Both the axes should be labelled clearly, scales to be mentioned and the name of the charts/ diagrams are to be mentioned clearly. The graph sheets are to be presented adjacent to the relevant calculations of the problems concerned.

7. All the problem sets enlisted in the syllabus must be completed, examined and signed with date by the teacher concerned. Finally, it should be arranged serially according to the content index.

8. There should be a content index at the very beginning of the Laboratory Note Book which consists of

   (a) Serial Number of the Chapters

   (b) Heading of the Chapters

   (c) Working Date

   (d) Running Page Number

RULES for the Practical Examination

1. The Practical Examination is to be held on a **single date** simultaneously in all the institutions.
2. If it is not possible to hold the examination on a single date, then there should be **at least three sets of questions** for different dates since Statistics Practical is a numerical problem based practical.
3. The Practical Examination will be of **two hours** duration including Viva-Voce.
4. Questions of Viva-Voce may be asked by the **External Examiner** to test the depth and understanding of the student in both theory and practical, preferably on Project Work.
5. Only **non-programmable** scientific calculators are allowed in the examination.
6. Statistical table will not be given in the question paper. Only some required values will be given in the question paper. **Statistical tables,** if required, should be supplied by the institutions on the date of examination for consultation of the students.
7. The completed Laboratory Note Book **duly checked** covering all the topics/chapters as prescribed in the syllabus must be submitted during the Practical Examination of both Class XI and Class XII.
8. Students **must bring the completed Project Work** given to them on the date of Practical Examination.