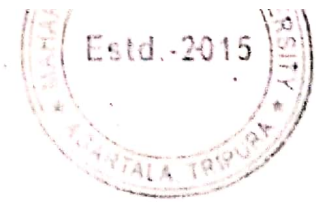


Maharaja Bir Bikram University
Statistics General [4th Semester]
Paper: STAT GE-4 / DSC-D (Credit 6)



Applied Statistics

Theory (Credit 4)

Unit I: (Index Number and Time-Series Analysis)

Definition, construction and use of price index numbers. Laspeyres', Passache's, Fisher's and Edgeworth-Marshall's index numbers. Time and factor reversal tests. Chain index number, wholesale and consumer price index numbers.

Different components of a time series. Determination of trend by free hand smoothing. Method of moving average and by fitting of a mathematical curve. Determination of seasonal indices by simple average method, method of trend ratios and ratios to moving averages.

Unit II: (ANOVA and Design of Experiments)

Analysis of Variance (ANOVA). Linear hypothesis. Basic concepts of fixed, random and mixed effect model. Analysis of variances for one-way and two-way classified data under fixed effect model.

Basic principles of experimental Design: randomization, replication and local control. Uniformity trials. Shape and sizes of plots and blocks. Completely Randomized design (CRD); Randomized Block design (RBD) and Latin Square design (LSD). Comparisons of efficiencies of CRD, RBD and LSD.

Unit III: (Statistical Quality Control)

Concepts of process and product control, Rational sub-grouping. Construction and use of control charts for mean, range, number of defectives (including the case of varying sub-group size), fraction defective and number of defects.

Unit IV: (Vital Statistics)

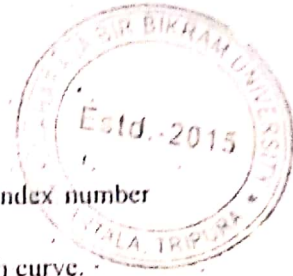
Introduction and sources of demographic data, measurement of population, rates and ratios of vital events. Measurement of mortality: CDR, SDR (w.r.t. Age and sex), IMR, Standardized death rates.

Complete Life (mortality) tables: definition of its main functions and uses. Measurement of fertility and reproduction: CBR, GFR, and TFR. Measurement of population growth: GRR, NRR.

Practical (Credit 2)

List of Practical (Computational tools: Electronic Calculator, Spreadsheet & SPSS)

1. Construction of price and quantity index numbers by Laspeyre's formula, Paasche's formula, Marshall-Edgeworth's formula and Fisher's Formula. Time reversal and factor reversal tests.



2. Construction of Consumer and wholesale price index numbers, fixed base index number and consumer price index number with interpretation.
3. Measurement of trend: Fitting of linear, quadratic trend, exponential & growth curve.
4. Measurement of seasonal indices by Simple average method, Ratio-to moving average method, Ratio-to-trend method.
5. One-way & two way ANOVA under fixed effect model.
6. Analysis of CRI, RBD and LSD.
7. Construction and interpretation of \bar{X} & R-chart.
8. Construction and interpretation p-chart (fixed sample size), d-chart and c-chart.
9. Computation of measures of mortality, fertility and population growth.
10. Computation of Complete Life table.

Suggested Reading

1. Goon A.M., Gupta M.K. & Dasgupta B. (2002): Fundamentals of Statistics (Vol-II), World Press, Kolkata.
2. Gupta S.C., Kapoor V. K.: Fundamentals of Applied Statistics, Sultan Chand & Sons.
3. Mukhopadhyay P. (1999): Applied Statistics. New Central Book Agency Pvt. Ltd.