Kakatiya University, Warangal
B.A/B.Sc. (Statistics) II Year, Semester-IV
(CBCS)(With Mathematics Combination)
(Examination at the end of II Year, Sem-IV)

SEC-2
Statistical Computation Using C-Programming
(2 HPW :: 2 Credits :: 50 Marks)

Unit-I

Components of C language, Structure of a C program. Tokens, Basic data types, Enumerated data type, Derived data types. Variables-declaration and assignment of variables; Local, Global, Parametric variables, Numeric, Character, real and string constants. Arithmetic, relational logical operators. Assignment operators. Increment and Decrement operators, conditional operators, Bitwise operators. Type modifiers and expressions, writing and interpreting expressions, using expressions in statements. Input/output statements.

Control statements, conditional statements, if..else, nesting of if..else, elseif ladder, switch statements, loops in C: for, while, do.., while loops, Break, continue, exit( ), goto and label declarations. One dimensional and two dimensional arrays. Functions, classification of functions, functions definition and declaration, assessing a function, return statement.

Unit-II

Writing C programs:

1. Formation of frequency distribution table for the given raw data by setting the number of classes and class width using functions.
2. Computation of Arithmetic Mean, Median and Mode, Standard deviation, Variance and co-efficient of variation, Moments, Skewness and Kurtosis for raw data and for grouped data using functions.
3. Computation of Karl-Pearson's coefficient of correlation and obtaining Regression lines Y on X and X on Y.

References:

1. C Programming Language: B. W. Kernighan & D. M. Ritchie, (2nd Edition).
2. Programming with C: Schaum Series.
3. Let us C: Yashwant Kanitker.
4. Data structures in C: E. Balagurusamy.

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Paper-IV: Statistical Inference (DSC-2D)
(4 HPW :: 4 Credits :: 100 Marks)

Unit-I

Concepts of statistical hypothesis, null and alternative hypotheses, critical region, two types of errors, level of significance and power of a test. One and two-tailed tests, test function (non-randomized and randomized). Neyman-Pearson's fundamental lemma for Randomized tests. Examples in case of Binomial, Poisson, Exponential and Normal distributions and their powers.

Unit-II

Use of central limit theorem in testing, Large sample tests and confidence intervals for mean(s), proportion(s), standard deviation(s) and correlation coefficient(s).

Unit-III

Tests of significance based on χ^2, t and F. χ^2-test for goodness of fit and test for independence of attributes. Definition of order statistics and statement of their distributions.

Unit-IV

Non-parametric tests: their advantages and disadvantages, comparison with parametric tests. Measurement scale- nominal, ordinal, interval and ratio. One sample runs test, sign test and Wilcoxon-signed rank tests (single and paired samples). Two independent sample tests: Median test, Wilcoxon –Mann-Whitney U test, Wald-Wolfowitz run test.

List of Reference Books:

1. V.K.Kapoor and S.C.Gupta: Fundamentals of Mathematical Statistics, Sultan Chand & Sons, New Delhi.
2. Goon A M, Gupta M K, Das Gupta B: Outlines of Statistics, (Vol-II), The World Press (Pvt) Ltd., Kolkata.
3. Hoel P.G: Introduction to Mathematical Statistics, Asia Publishing house.
4. Sanjay Arora and Bansilal: New Mathematical Statistics, Satya Prakashan , New Delhi.
5. Hogg and Craig: Introduction to Mathematical statistics, Prentice Hall.
6. Siegal S and Sidney: Non-parametric statistics for Behavioral Science: Mc Graw hill.
7. Gibbons J.D and Subhabrata Chakraborti: Non-parametric Statistical Inference, Marcel Dekker.

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8. Parimal Mukhopadhyay: Mathematical Statistics, New Central Book agency.
9. Conover: Practical Non-parametric Statistics, Wiley Series.
10. V.K.Rohatgi and A.K.Md. Ehsanes Saleh: An introduction to Probability and Statistics, Wiley Series.
11. Mood A M, Graybill F A, Boe's D C: Introduction to theory of Statistics, TMH.
12. Telugu Academy: Paramithiya Mariyu Aparamithiya Parikshalu.
13. K.V.S. Sarma: Statistics made simple: Do it yourself on PC, PHI.
14. Gerald Keller: Applied Statistics with Microsoft Excel, Duxbury Thomson Learning.
15. Levin, Stephan, Krehbiel, Berenson: Statistics for Managers using Microsoft Excel, (4th edition), Pearson Publication.
16. Hogg, Tanis, Rao: Probability and Statistical Inference, (7th edition), Pearson Publication.
17. Milton and Arnold: Introduction to Probability and Statistics, (4th Edition),TMH.

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Practical-4
Statistical Inference
(2 HPW :: 1 Credit :: 50 Marks)

1. Large sample tests for mean(s), proportion(s), Standard deviation(s) and correlation coefficient.
2. Small sample tests for single mean and difference of means and correlation coefficient.
3. Paired t-test.
4. **Small sample tests for mean(s), paired t-test and correlation coefficient using MS Excel.**
5. Small sample test for single and difference of variances.
6. **Small sample test for single and difference of variances using MS Excel.**
7. χ^2 – test for goodness of fit and independence of attributes.
8. **χ^2 – test for goodness of fit and independence of attributes using MS Excel.**
9. Nonparametric tests for single and related samples (sign test and Wilcoxon signed rank test) and one sample run test.
10. Nonparametric tests for two independent samples (Median test, Wilcoxon Mann Whitney - U test, Wald - Wolfowitz run test)

Note: Training shall be on establishing formulae in Excel cells and deriving the results. The Excel output shall be exported to MS Word for writing inferences.

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