

FACULTY OF SCIENCE
B.Sc. (CBCS) III – Semester Examination, December 2017
Subject : STATISTICS
Paper – III
Statistical Methods

Max. Marks : 80

Time : 3 hours

Part – A (5 X 4 = 20 Marks)
(Short Answer Type)

Answer any Five of the following questions.

1. Explain the scattered diagram method for measuring the correlation.
2. Explain the concept of two lines of regression.
3. State the formula for the computation of a partial correlation coefficients for three variables.
4. Define i) order of a class ii) Ultimate classes
5. Define i) Population parameter and ii) Sample statistic with examples.
6. Define unbiasedness of an estimator with an example.
7. State the properties of Maximum likelihood estimator.
8. Define interval estimation.

Part – B (4 X 15 = 60 Marks)
(Essay Answer Type)

Answer ALL questions from the following :

9. a) i) Obtain the formula for spearman's rank correlation coefficient.
ii) Derive the normal equations for fitting of a curve of the type $y = ax^b$.
OR
b) i) Derive the Regression line of Y on X.
ii) State and prove the properties of regression coefficients.
10. a) i) Define multiple correlation with an example for three variables and state the formula for $R_{1.23}$, $R_{2.13}$ and $R_{3.12}$.
ii) If $r_{12} = 0.77$, $r_{13} = 0.72$ and $r_{23} = 0.52$. Find the values of $R_{1.23}$, $R_{2.13}$ and $R_{3.12}$.
OR
b) i) Define positive association, negative association and independence of attributes.
ii) Derive the relationship between Yule's coefficient of association and coefficient of colligation.
11. a) i) Define sampling distribution of a statistic and standard error.
ii) Define χ^2 - distribution. State its properties and applications.
OR
b) i) Define consistency and sufficiency with examples.
ii) State and prove sufficient conditions for consistency.
12. a) i) State Neyman's Factorization theorem.
ii) Find the sufficient estimator for θ in case of exponential distribution.
OR
b) i) Explain the method of MLE.
ii) Find the MLE for the parameter λ of Poisson distribution on the basis of sample of size n. Also find its variance.
