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Code No. 7070

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

Time : 3 hours

Max. Marks : 80

**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  $\chi^2$  - 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  $\theta$  in case of exponential distribution.
- OR**
- b) i) Explain the method of MLE.  
ii) Find the MLE for the parameter  $\lambda$  of Poisson distribution on the basis of sample of size n. Also find its variance.

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