OR

5. (P) Show that correlation coefficient is the geometric mean of the regression coefficients. 4

(Q) Obtain the normal equations for fitting an exponential curve $y = ab^x$ 4

(R) Define multiple correlation with example. 4

6. (A) Explain how would you express class frequency of first order in terms of class frequencies of third order. 4

(B) What do you mean by consistency of data ? Obtain the condition of consistency for two attributes A and B. 4

(C) What do you mean by independence of attributes ? Give a criterion of independence for attributes A and B. 4

OR

7. (P) What do you mean by association of attributes ? 4

(Q) Define Yule's coefficient of association and the coefficient of colligation. Establish the relation between them. 4

Second Semester B. Sc. (Part – I) Examination

2S – STATISTICS

P. Pages : 6

Time : Three Hours]   [Max. Marks : 80

Note : All questions are compulsory.

1. (A) Fill in the blanks.

(i) When the two variables deviates in the opposite direction then the correlation is ——— correlation.

(ii) The classes of highest order is ——— classes.

(iii) If $X \sim B(n, p)$ Then $V(x)$ = ———.

(iv) Normal distribution is a ——— distribution. 2

(B) Choose the correct alternatives.

(i) If x and y are independent then r_{xy} =

(a) 0   (b) 1

(c) –1   (d) ∞

(ii) Attributes A and B are independent if

(a) $(AB) > \dfrac{(A)(B)}{N}$ (b) $(AB) < \dfrac{(A)(B)}{N}$

(c) $(AB) = \dfrac{(A)(B)}{N}$ (d) None of these

(iii) The sum of two independant Poisson variate is a ——— variate.

(a) Binomial   (b) Poisson

(c) Normal   (d) Negative Binomial

(iv) For a symmetrical distribution ———

(a) Mean > Mode > Median

(b) Mean < Mode < Median

(c) Mean ≠ Mode ≠ Median

(d) Mean = Mode = Median   2

(C) Answer in **one** sentence :—

(i) What do you mean by regression ?

(ii) State the meaning of dichotomous classification.

(iii) State the relationship between mean and variance of Poisson distribution.

(iv) Give the probability density function of normal distribution with parameters μ and σ^2.   4

2. (A) Define Karl Pearson's correlation coefficient. State its limit.   4

(B) Show that correlation coefficient is independant of change of origin and scale. 4

(C) Obtain the Spearman's formula for rank corrlation coefficient.   4

OR

3. (P) Define the term :—

(i) Positive correlation.

(ii) Negative correlation.   4

(Q) What do you mean by Rank correlation ?   4

(R) Define the term intraclass correlation.   4

4. (A) State the equations of two lines of regression.   4

(B) Prove that if one of the regression coefficient is greater than unity the other must be less than unity.   4

(C) Obtain the normal equations for fitting a linear regression.   4

(R) Examine the consistency of the following data.

N = 1000, (A) = 600, (B) = 500, (AB) = 50

4

8. (A) Define the binomial distribution with parameters n and p. Obtain its moment generating function. 6

(B) Define negative binomial distribution with parameters r and p. Find its mean and variance. 6

OR

9. (P) Define discrete uniform distribution and hence find its mean. 6

(Q) The mean and variance of Binomial distribution are 4 and $4/3$ respectively. Find $P(x \geq 1)$ 6

10. (A) If $x \sim p(\lambda)$ Show that its mean and variance are equal. 4

(B) Discuss the additivity property of independant Poisson variates. 4

(C) State the probability mass function of the geometric distribution. Obtain the first two moments of the geometric distribution. 4

OR

11. (P) Derive the poisson distribution as a limiting case of Binomial distribution.   4

    (Q) Obtain the moment generating function and cumulant generating function of the Poisson distribution.   4

    (R) Obtain mean and variance of the hypergeometric distribution.   4

12. (A) State the probability density function of noraml distribution with parameters μ and σ^2. Discuss the chief charactertics of Normal probability curve.   6

    (B) Obtain the moments of continuous uniform distribution. Why is it also called as rectangular distribution ?   6

OR

13. (P) Define standard normal variate. State its probability density function. Obtain moment generating function of the Normal distribution.   6

    (Q) Define exponential distribution with parameter θ. Find its moment generating function and hence find its mean and variance.   6