# B.Sc. (Part–I) Semester-II Examination
## STATISTICS

Time : Three Hours] [Maximum Marks : 80

**Note :**—All questions are compulsory.

1. (A) Fill in the blanks : 2

(i) When the two variables deviate in the same direction then the correlation is _____ correlation.

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

(iii) The mean of binomial distribution with parameters n & p is _____.

(iv) The points of inflexion of normal curve are _____.

(B) Choose the correct alternative : 2

(i) If X and Y are independent then $r_{xy}$ = _____

(a) 0 (b) 1

(c) -1 (d) $\infty$

(ii) Attributes A & B are independent if _____

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

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

(iii) The mean of Poisson variate is _____ its variance.

(a) Greater than (b) Less than

(c) Equal to (d) Twice

(iv) The standard normal distribution is represented by _____.

(a) N (0,0) (b) N (1,1)

(c) N (0,1) (d) N (1,0)

(C) Answer in one sentence each : 4

(i) What do you mean by regression?

(ii) What do you mean by complete association?

(iii) State the probability mass function of negative binomial distribution.

(iv) How is the shape of the normal curve?

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

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

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

**OR**

3. (P) Define the terms :

(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 coefficients is greater than unity the other must be less than unity. 4

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

**OR**

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

(Q) Obtain the normal equations for fitting a second degree parabola. 4

(R) Define multiple correlation. 4

6. (A) Define the following terms :

(i) Order of classes and class frequencies.

(ii) Association of attributes. 4

(B) What do you mean by consistency of data? Obtain the conditions for consistency of data in case of two attributes. 4

(C) Define Yule's coefficient of association and coefficient of colligation. 4

**OR**

7. (P) Show that for n attributes $A_1, A_2, A_3, \ldots\ldots, A_n$

$(A_1 A_2 A_3 \ldots\ldots A_n) \geq (A_1) + (A_2) + \ldots\ldots + (A_n) \quad (n-1)\ N$ 4

(Q) What do you mean by independence of attributes? Give a criteria of independence for attributes A & B. 4

(R) Examine the consistency of the following data :

N = 1000 (A) = 600 (B) = 500 (AB) = 50. 4

8. (A) Define discrete uniform distribution & find its mean. 4

(B) Define Bernoulli distribution and find its mean. 4

(C) Explain how will you find the moments of Negative Binomial distribution from those of Binomial distribution. 4

**OR**

9. (P) Obtain the moment generating function of Binomial distribution. 4

(Q) The mean and variance of Binomial distribution are 4 & $\frac{4}{3}$ respectively. Find parameters of Binomial distribution. 4

(R) Obtain the moment generating function of negative Binomial distribution with parameters (r,p). 4

10. (A) State the probability mass function of Poisson distribution with parameter $\lambda$ & hence find its first two moments. 6

(B) Define Geometric distribution. Obtain its mean and variance. 6

**OR**

11. (P) Obtain first four moments of Poisson distribution. 6

(Q) Define hypergeometric distribution & obtain its mean. 6

12. (A) For a rectangular variate X in (a,b) obtain the mean deviation about mean. 6

(B) What are the chief characteristics of normal distribution? 6

**OR**

13. (P) Obtain the moment generating function of Normal Distribution. 6

(Q) State the area property in Normal Distribution. 6