

**INTERMEDIATE PART-II (12<sup>th</sup> CLASS)****STATISTICS PAPER-II (NEW SCHEME)**

TIME ALLOWED: 3.10 Hours

**SUBJECTIVE**

MAXIMUM MARKS: 83

**NOTE: - Write same question number and its part number in answer book, as given in the question paper.****SECTION-I**

- 2. Attempt any eight parts. 8 × 2 = 16**
- (i) What do you understand by Standard Normal Dist.?
  - (ii) In Normal Dist., mean is 100 and SD is 10. Find M.D and Q.D.
  - (iii) Find Prob. that the value of standard normal variable is less than 2.
  - (iv) In Normal dist., find (a)  $E|X - \mu|$  (b)  $E|X - \mu|^2$
  - (v) Define points of inflection in Normal Dist.
  - (vi) Discuss estimation and its types.
  - (vii) What do you mean by Unbiased Estimator?
  - (viii) Find point estimation of pop. Mean ( $\mu$ ) and standard error of mean.
  - (ix) Explain type – I and type – II error.
  - (x) Define One-tailed and Two-tailed tests.
  - (xi) How many are types of Computer?
  - (xii) What are output devices of Computer?
- 3. Attempt any eight parts. 8 × 2 = 16**
- (i) What is Population?
  - (ii) Write down any two advantages of sampling.
  - (iii) What is non sampling error?
  - (iv) What is random sampling?
  - (v) Define Stratum.
  - (vi) What are the limitations of sampling?
  - (vii) Define Simple Regression.
  - (viii) What is Principle of Least Squares?
  - (ix) Define Dependent Variable.
  - (x) Define the term Correlation.
  - (xi) What is meant by Negative Correlation?
  - (xii) What is the range of Correlation Co-efficient?
- 4. Attempt any six parts. 6 × 2 = 12**
- (i) Define +ve and –ve attributes.
  - (ii) Define Contingency table.
  - (iii) Define the term 'rank correlation co-efficient'.
  - (iv) Define time series and give some examples.
  - (v) What are the names of basic components of time series?
  - (vi) Give name of different methods of measuring the secular trend.
  - (vii) What is meant by Seasonal Variation?
  - (viii) Write the equation of 2<sup>nd</sup> degree parabola.
  - (ix) Differentiate between Signal and Noise.

**SECTION-II****NOTE: - Attempt any three questions.**

- 5.(a) In a normal distribution  $\mu = 113.49$  and  $Q_1 = 100$ , find value of  $\beta_2$ .  
4
- (b) If  $X \sim N(10; 4)$  then find (i)  $P(X > 16)$  (ii)  $P(8 < X < 12)$  4
- 6.(a) Given the population values 2, 5, 8. Taking all possible samples of size 2 with replacement form the sampling distribution of  $\bar{X}$ . Compute  $\mu_{\bar{X}}$  and  $\sigma_{\bar{X}}^2$  and verify that (i)  $\mu_{\bar{X}} = \mu$  (ii)  $\sigma_{\bar{X}}^2 = \frac{\sigma^2}{n}$  4
- (b) If Mean and Variance of a population are 5 and 2.15, what would be the standard error if samples of size 4 are drawn with replacement? 4

**P.T.O**

- 7.(a) A random sample of size 36 is taken from a normal population with known variance  $\sigma^2 = 25$ . If  $\bar{X} = 42.6$ , find 95% confidence interval for the population mean ( $\mu$ ). 4
- (b) Given the following information:-  $n = 30$ ,  $\bar{X} = 15.2$ ,  $\sigma = 3$ . Test the hypothesis that  $\mu = 15.8$  at  $\alpha = 0.05$  4
- 8.(a) Compute 'r' from the following data:-  $\bar{X} = 14.6$   $\bar{Y} = 12.7$   $\sum (X - \bar{X})^2 = 115.96$   
 $\sum (Y - \bar{Y})^2 = 59.04$ ,  $\sum (X - \bar{X})(Y - \bar{Y}) = 53.95$ ,  $n = 10$  4
- (b) Construct the regression equation of demand on price, in the form  $\hat{Y} = a + bx$ . 4
- |        |    |    |    |    |    |    |    |
|--------|----|----|----|----|----|----|----|
| Price  | 4  | 6  | 7  | 9  | 11 | 13 | 14 |
| Demand | 10 | 11 | 13 | 13 | 14 | 16 | 17 |
- 9.(a) 750 students appeared in an examination and 470 were successful. 465 had attended classes and 58 of them failed. Calculate the coefficient of association to discuss association between attending classes and success. 4
- (b) Why the method of least squares derive a linear trend to the following results for the years 1985 to 1994 (both inclusive):-  $\sum X = 0$ ,  $\sum Y = 322$ ,  $\sum XY = 1550$ ,  $\sum X^2 = 330$ . Find out trend values as well. 4

### SECTION-III (PRACTICAL)

10. NOTE: - Attempt any three parts.

3 × 5 = 15

- (a) A population consists of 2, 4, 6, 8.  
 Find (i) Mean, variance and standard deviation of population  
 (ii) Make sample of size 3 without replacement and find means of all the samples.  
 (iii) Make sampling dist – of  $\bar{X}$

(iv) Verify the result  $\mu_{\bar{X}} = \mu$ ,  $S.E(\bar{X}) = \frac{\sigma}{\sqrt{n}} \sqrt{\frac{N-n}{N-1}}$

- (b) Given that  $\bar{X}_1 = 75$ ,  $n_1 = 9$ ,  $\sum (X_{i1} - \bar{X}_1) = 1482$   
 $\bar{X}_2 = 60$ ,  $n_2 = 16$ ,  $\sum (X_{i2} - \bar{X}_2) = 1830$   
 and assuming that two samples were randomly selected from the Normal Population in which  $\sigma_1^2 = \sigma^2$  (but unknown). Calculate an 80 % confidence interval for the difference between two population means.

- (c) Calculate the correlation coefficient between the variable  $X$  and  $Y$  represented in the following table:-

$X_i$	2	4	5	6	8	11
$Y_i$	18	12	10	8	7	5

- (d) A random sample of 15 men and 15 women were polled as to their desires concerning the ownership of television set. The following data are resulted:-

Classification	Men	Women
Want television	5	8
Don't want television	10	7

Test the hypothesis that desire to own a television set is independent of sex at .05 level of significance.

- (e) From the data given below:-

Year	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969
Value	318	326	337	340	359	365	372	381	402	410

Obtain trend values using method of Semi-Average.