

## COMMON FIRST REVISION TEST - 2023

Standard XII  
STATISTICSReg.No. 

H	1	2	0	8	5
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Time: 3.00 hours

Marks: 70

## Part - I

I. Choose the correct answer:

15 x 1 = 15

1. In general, large sample theory is applicable when
  - a)  $n \geq 100$
  - b)  $n \geq 50$
  - c)  $n \geq 40$
  - d)  $n \geq 30$
2. What is the standard error of the sample proportion under  $H_0$ ?
  - a)  $\sqrt{\frac{PQ}{n}}$
  - b)  $\sqrt{\frac{pq}{n}}$
  - c)  $\frac{PQ}{n}$
  - d)  $\frac{pq}{n}$
3. If a random sample of 10 observations has variance 324 then standard error is
  - a)  $\frac{18}{\sqrt{10}}$
  - b)  $\frac{18}{10}$
  - c)  $\frac{10}{18}$
  - d)  $\frac{2}{\sqrt{5}}$
4. If the order of the contingency table is 5 x 4. Then the degree of freedom of the corresponding chi-square test statistic is
  - a) 18
  - b) 17
  - c) 12
  - d) 25
5. ANOVA technique originated in the field of
  - a) industry
  - b) agriculture
  - c) medicine
  - d) genetics
6. In two way classification the total variation TSS is
  - a)  $SST + SSB + SSE$
  - b)  $SST - SSB + SSE$
  - c)  $SST + SSB - SSE$
  - d)  $SST + SSB$
7. If  $\sum D^2 = 0$ , rank correlation is
  - a) 0
  - b) 1
  - c) 0.5
  - d) -1
8. \_\_\_\_\_ measures the degree of relationship between two variables.
  - a) standard deviation
  - b) correlation coefficient
  - c) moment
  - d) median
9. Correlation coefficient is the \_\_\_\_\_ between the regression coefficients.
  - a) Arithmetic mean
  - b) Geometric mean
  - c) Harmonic mean
  - d) None of the above
10. The regression lines intersect at
  - a)  $(\bar{X}, \bar{Y})$
  - b)  $(X, Y)$
  - c)  $(0, 0)$
  - d)  $(1, 1)$
11. The index that satisfies factor reversal test is
  - a) Paasche's index
  - b) Laspeyre's index
  - c) Fisher's ideal index
  - d) Walsh price index
12. A time series consists of
  - a) two components
  - b) three components
  - c) four components
  - d) five components
13. In the least square theory the sum of squares of residuals is
  - a) zero
  - b) minimum
  - c) constant
  - d) maximum
14. The first Honorary statistical advisor to Government of India is
  - a) P.C.Mahalanobias
  - b) Col.Sykes
  - c) C.Rengarajan
  - d) Dr.Francis Buchanan

(2)

15. Opinion poll in a study is conducted
- before the process start
  - after the process start
  - middle of the process
  - at any point of time of the process

**Part - II****6 x 2 = 12****II. Answer any 6 questions: (Q.No.23 is compulsory)**

- Define standard error of a statistic.
- Define chi-square statistic.
- What is analysis of variance?
- Define Co-variance.
- Define base period.
- Write short notes on irregular variation.
- Why is a project work needed in the curriculum?
- Find the standard deviation of Y. Gn. that  $V(X)$  is 36,  $b_{XY} = 0.8$ ,  $r_{XY} = 0.5$

**Part - III****6 x 3 = 18****III. Answer any 6 questions: (Q.No.31 is compulsory)**

- What do you mean by level of significance?
- What is contingency table?
- What are the components in two-way ANOVA?
- Test the consistency of the following data with the symbols having their usual meaning  
 $N = 1000$ ,  $(A) = 600$ ,  $(B) = 500$ ,  $(AB) = 50$
- Write any three properties of regression.
- Give the diagrammatic representation of different types of index number.
- What is seasonal variation?
- If the number of deaths occurred in 980 in a town consisting of 1,50,000 persons during a period, quantify the death rate of the town using suitable formula.

**Part - IV****5 x 5 = 25****IV. Answer all the questions:**

- Carry out hypotheses testing exercise for testing  $H_0: \mu_X = \mu_Y$  against  $H_1: \mu_X \neq \mu_Y$  with usual notations, when  $\bar{x} = 7$  and  $\bar{y} = 8$ ,  $\sigma_X = 3$  and  $\sigma_Y = 2$  and  $m = 40$  and  $n = 40$ . Use  $\alpha = 0.01$  (OR)
  - A normal population has mean  $\mu$  (unknown) and variance 9. A sample of size 9 observations has been taken and its variance is found to be 5.4. Test the null hypothesis  $H_0: \sigma^2 = 9$  against  $H_1: \sigma^2 > 9$  at 5% level significance.
- A medical researcher claims that the variance of the heart rates (in beats per minute) of smokers is greater than the variance of heart rates of people who do not smoke. Samples from two groups are selected and the data is given below. Using  $\alpha = 0.05$ , test whether there is enough evidence to support the claim.

Smokers	Non-smokers
$m = 25$	$n = 18$
$S_1^2 = 36$	$S_2^2 = 10$

(OR)

(3)

XII Statistics

- b) A random sample of 5 college students is selected and their marks in Tamil and English are found to be

Tamil	85	60	73	40	90
English	93	75	65	50	80

Calculate Spear's man rank correlation coefficient.

34. a) Out of 1800 candidates appeared for a competitive examination 625 were successful; 300 had attended a coaching class and of these 180 came out successful. Test for the association of attributes attending the coaching class and the success in the examination.

(OR)

- b) Construct the simple linear regression equation of Y on X if  $n = 7$ ,  $\sum_{i=1}^n x_i = 113$ ,

$$\sum_{i=1}^n x_i^2 = 1983, \sum_{i=1}^n y_i = 182 \text{ and } \sum_{i=1}^n x_i y_i = 3186.$$

35. a) Construct weighted aggregate index numbers of price from the following data by applying

1. Laspeyre's method
2. Paache's method
3. Dorbish and Bowley's method
4. Fisher's ideal method
5. Marshall Edgeworth method

Commodity	2016		2017	
	Price	Quantity	Price	Quantity
A	2	8	4	6
B	5	10	6	5
C	4	14	5	10
D	2	19	2	13

(OR)

- b) Find the trend values using semi average method. The following table shows the area covered for cultivation of Ragi in Tamilnadu. (in 1000 hectares)

Year	2003	2004	2005	2006	2007	2008	2009	2010
Area (in 1000 hectares)	118	109	100	95	94	90	82	76

36. a) What are the importance of vital statistics?

(OR)

- b) State the points kept in mind while writing the questionnaire.

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