

**2023/TDC(CBCS)/ODD/SEM/  
STSHCC-101T/109**

**TDC (CBCS) Odd Semester Exam., 2023**

**STATISTICS**

**( Honours )**

**( 1st Semester )**

Course No. : STSHCC-101T

**( Descriptive Statistics )**

Full Marks : 50

Pass Marks : 20

Time : 3 hours

*The figures in the margin indicate full marks  
for the questions*

**SECTION—A**

Answer *ten* questions, selecting any *two* from each

Unit : 2×10=20

**UNIT—I**

1. Define statistics. Define a population and a sample.
2. Distinguish between qualitative data and quantitative data.
3. What are less than and more than ogives?

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UNIT—II

4. What are the different measures of central tendency? Which of them are mathematical measures and which are positional measures?
5. What is the basic difference between measures of central tendency and measures of dispersion?
6. Define the  $r$ th law moment and the  $l$ th central moment. What is the value of the first central moment?

UNIT—III

7. Define Karl Pearson's coefficient of correlation and mention its properties.
8. Define the line of regression of  $X$  on  $Y$ . What is the relationship between correlation coefficient and the regression coefficient?
9. What is a scatter diagram? How do you get an idea about positive and negative correlation from a scatter diagram?

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( Continued )

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UNIT—IV

10. What do you mean by association of attributes? When are two attributes said to be positively or negatively associated?
11. Examine the consistency of the following data:  
 $N = 500, (A) = 410, (B) = 380, (AB) = 270$
12. What is the necessary and sufficient condition for the consistency of data? Also define the coefficient of association.

UNIT—V

13. Prove that for two mutually exclusive events  $A_1$  and  $A_2$   
$$P(A_1 \cup A_2) = P(A_1) + P(A_2)$$
14. If  $A, B$  and  $C$  are three events such that  $P(A) = \frac{2}{3}, P(B) = \frac{1}{4}$  and  $P(C) = \frac{1}{6}$ . Can  $A, B$  and  $C$  be mutually exclusive?
15. When are the events  $A$  and  $B$  said to be independent? For two independent events  $A$  and  $B$ , what is  $P(AB) = ?$

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( Turn Over )

( 4 )

SECTION—B

Answer five questions, selecting one from each  
Unit :  $6 \times 5 = 30$

UNIT—I

16. Write briefly about the scope of statistics.
17. Give a brief description about graphical representation of statistical data.

UNIT—II

18. Show the effect of change of origin and scale on the arithmetic mean and standard deviation.  $3+3=6$
19. What do you mean by skewness and kurtosis? What are their measures? Give a brief description.  $2+2+2=6$

UNIT—III

20. Obtain the line of regression of  $X$  on  $Y$  and  $Y$  on  $X$ .
21. What is Spearman's formula for rank correlation? Give the formula.

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( Continued )

( 5 )

UNIT—IV

22. Explain the method of least squares for fitting a polynomial of degree  $p$  to the set of data  $(x_i, y_i); i = 1, 2, \dots, n$ .
23. Explain the principle of least squares in fitting curves of the type  $y = ax^b$ . Hence obtain the normal equations.

UNIT—V

24. State and prove the addition and multiplication theorems of probability.
25. State and prove Bayes' theorem for future events

$$P(C/B) = \frac{\sum_{i=1}^n P(A_i) P(B/A_i) P(C/A_i B)}{\sum_{i=1}^n P(A_i) P(B/A_i)}$$

where  $A_i; i = 1, 2, \dots, n$  are mutually exclusive and exhaustive events,  $B$  is an event that can occur only if any of  $A_i$  occurs, and  $C$  is an event that can occur only if  $B$  has already occurred.

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