

1 SEM TDC STSH (CBCS) C 1

2021

(Held in January/February, 2022)

STATISTICS

(Core)

Paper : C-1

(Descriptive Statistics)

Full Marks : 50

Pass Marks : 20

Time : 2 hours

The figures in the margin indicate full marks for the questions

1. Choose the correct answer of the following : 1×5=5

(a) With the help of ogive, one can determine

(i) median

(ii) deciles

(iii) quartiles

(iv) All of the above

- (b) Arithmetic mean, geometric mean and harmonic mean in any series are equal when
- (i) the distribution is symmetric
 - (ii) all the values are same
 - (iii) the distribution is positively skewed
 - (iv) the distribution is unimodal
- (c) The sum of squares of deviation of observations is least when measured from
- (i) median
 - (ii) origin
 - (iii) mode
 - (iv) None of the above
- (d) The coefficient of correlation
- (i) cannot be positive
 - (ii) cannot be negative
 - (iii) is always positive
 - (iv) can be both positive as well as negative
- (e) Index for base period is always taken as
- (i) 1
 - (ii) 100
 - (iii) 1000
 - (iv) 0

2. Answer the following questions in brief : $2 \times 5 = 10$

(a) Differentiate between primary data and secondary data.

(b) For two values x_1 and x_2 , prove that $AM \times HM \geq (GM)^2$.

(c) Write down the Bowley's formula for measuring skewness.

(d) Explain why there are two lines of regression.

(e) What do you mean by chain-based index number?

3. (a) What are the different measures of scales used in statistics? Explain with suitable example. 7

Or

(b) What do you mean by cumulative frequency curve or ogive? What are the different types of ogive? Explain their uses. $2+2+3=7$

4. Answer any two questions of the following : $7 \times 2 = 14$

(a) Compare mean, median and mode as measures of location of a distribution. Prove that the sum of the squares of the deviations of observations about mean is the least. $4+3=7$

(b) What is standard deviation? Explain its superiority over other measures of dispersion. Show that for any distribution, the standard deviation is not less than the mean deviation from the mean. 2+2+3=7

(c) Define raw moments and central moments. Obtain the relation between the central moments of order r in terms of the raw moments. 2+5=7

5. (a) Define rank correlation. Deduce Spearman's formula for rank correlation coefficient. 2+5=7

Or

(b) Define multiple correlation. Show that the multiple correlation coefficient $R_{1.23}$ in usual notation is given by
$$R_{1.23}^2 = 1 - \frac{\omega}{\omega_{11}}$$
 2+5=7

6. (a) Explain briefly time-reversal test and factor-reversal test of index number. Show that Fisher's index number formula satisfies both the time-reversal test and factor-reversal test. 2+5=7

Or

(b) What do you mean by consumer price index? Discuss the various steps in the construction of consumer price index. 2+5=7
