



WEST BENGAL STATE UNIVERSITY
B.Sc. Honours 1st Semester Examination, 2020, held in 2021

STSACOR01T-STATISTICS (CC1)

DESCRIPTIVE STATISTICS

Time Allotted: 2 Hours

Full Marks: 40

*The figures in the margin indicate full marks.
Candidates are required to give their answers in their own words as far as practicable.
All symbols are of usual significance.*

GROUP-A

Answer any four questions from the following

5×4=20

1. Let \bar{x} , M and s be the mean, median and s.d. respectively, for a data set. Show that $s \geq |\bar{x} - M|$. 5
2. Describe the merits and demerits of median. 5
3. Let x be a variable assuming the values $1, 2, \dots, k$ and let $F_1 = n, F_2, \dots, F_k$ be the corresponding cumulative frequencies of the 'greater than' type. Show that $\bar{x} = \sum_{i=1}^k F_i / n$, where \bar{x} is the mean. 5
4. Prove that, Mean deviation MD_A is a minimum, where A is a median. 5
5. Explain with example how to use Stem-and-leaf plot to describe a sample. 5
6. Distinguish between the following : $2\frac{1}{2} + 2\frac{1}{2}$
(a) Interval scale and ratio scale, (b) Cross-section data and time series data.

GROUP-B

Answer any two questions from the following

10×2=20

7. (a) A variate takes the value $a, ar, ar^2, \dots, ar^{n-1}$ each with frequency unity. If A, G and H are the arithmetic mean, geometric mean and harmonic mean respectively, show that $A > G > H$. 5+5
(b) Distinguish between absolute and relative measures of dispersion.

8. (a) Derive product-moment correlation coefficient. State and prove its important results. 6+4
(b) Find the correlation coefficient between $(x+y)$ and $(x-y)$.
9. (a) Show that angles between two regression lines are $\tan^{-1}\left[\pm \frac{1-r^2}{r} \frac{s_x s_y}{s_x^2 + s_y^2}\right]$. 5+5
(b) Derive the standard error of predicted value of y from its linear regression on x .
- 10.(a) Define skewness and kurtosis. Suggest one measure of each of these. 5+5
(b) Show that r_R lies between -1 and $+1$. Give examples for $r_R = \pm 1$.

N.B. : *Students have to complete submission of their Answer Scripts through E-mail / Whatsapp to their own respective colleges on the same day / date of examination within 1 hour after end of exam. University / College authorities will not be held responsible for wrong submission (at in proper address). Students are strongly advised not to submit multiple copies of the same answer script.*

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