Unique Science Academy, 60 – D Nawab Town, Lahore

Statistics 11 Monthly Test

(Chapter 4 – Measure of Dispersion – Skewness and Kurtosis)

29 August 2024 Allowed Time: 40 minutes

Total Marks: 25

Name _____

Q.1 Select all that are true. **(1 x 5 = 5)**

1. Which of the following is / are correct formula(s) for standard deviation?

(a) $\sqrt{\frac{\sum X^2}{n} - \left(\frac{\sum X}{n}\right)^2}$

(b) $\frac{\sum X^2}{n} - \left(\frac{\sum X}{n}\right)^2$

(c) $\sqrt{\frac{\sum (X-\bar{X})^2}{n}}$

(d) $\frac{\sum (X-\bar{X})^2}{n}$

2. Which of the following is / are formulas for the coefficient of skewness?

(a) b_1

(b) $\sqrt{b_1}$

(c) $\frac{\text{Mean}-\text{Mode}}{\text{Standard Deviation}}$

(d) $\frac{3(\text{Mean}-\text{Median})}{\text{Standard Deviation}}$

(e) $\frac{Q_1+Q_3-2\ \text{Median}}{Q_3-Q_1}$

3. Which of the following is / are formulas for Kurtosis?

(a) b_2

(b) $\sqrt{b_2}$

(c) $K = \frac{\frac{Q_3-Q_1}{2}}{P_{90}-P_{10}}$

(d) $K = \frac{Q.D}{P_{90}-P_{10}}$

4. If 5 is added to every single value in a dataset then the original arithmetic mean of that data set will be:

(a) Decreased by 5

(b) Increased by 5

(c) Remain same

(d) Multiplied by 5

5. Sum of deviation from arithmetic mean is

(a) One

(b) Zero

(c) Negative

(d) Positive

Q2. The grouped data is given as follows: **(20)**

Classes	f_i	x_i	$u_i = \frac{x_i - 741.5}{69}$	$f_i u_i$	$f_i u_i^2$	$f_i u_i^3$	$f_i u_i^4$
500 – 569	2						
569 – 638	5						
638 – 707	15						
707 – 776	6						
776 – 845	10						
845 – 914	10						
914 – 983	2						
Total							

(i) Fill the table (2)

(ii) What is the value of arbitrary constant a and class interval h? (2)

(iii) Find moments about origin using the following formula (6)

$$m_r' = \frac{\sum_{i=1}^{n} f_i u_i^r}{\sum_{i=1}^{n} f_i} \times h^r$$

(iv) Find first four moments about mean m_1 , m_2 , m_3 and m_4. (5)

(v) Find coefficient of skewness $\sqrt{b_1}$ and Kurtosis b_2. (5)