

## SEM 2: STATISTICAL METHODS FOR ECONOMICS-1

### UNIT 3 AND 4

#### PRACTICE SET 1

1. The arithmetic mean and variance of  $n$  values  $x_1, x_2, \dots, x_n$ , are 0 and  $\sigma^2$ .  $y$  is a variable defined as,  $y = x^2$ . prove that  $\bar{y} = \sigma^2$
2. The s.d calculated from 32 observation is 5. If the sum of the observations is 80. Find the sum of squares?
3.  $\bar{X}$  is the mean of  $X_1, X_2, X_3$ . If  $x_1, x_2, x_3$ , are the deviations of  $X_1, X_2, X_3$ , from  $\bar{X}$  respectively. Then show that,  $x_1^2 + x_2^2 + x_3^2 = X_1^2 + X_2^2 + X_3^2 - 3\bar{X}^2$
4. If  $z^2 =$  mean square deviation about  $x$ ,  $\sigma^2$  is the variance of  $x$ , and  $x - \bar{x} = p$ . Then show that,  $z^2 = \sigma^2 + p^2$
5. Calculate standard deviation of 85, 20, 120, 60, 40, 37
6. Consider the following sets of data:
  - 9, 9, 9, 9, 9, 9, 9, 9, 9, 9
  - 10, 6, 2, 8, 4, 14, 16, 12
  - 13 10, 7, 6, 21, 3, 7, 5

Find out mean for all the three sets. Find out which set of data has the (i) least variability, (ii) greatest variability.

7. The heights in cm of a group of first year biology students were recorded. The variance of these heights was subsequently calculated. The unit of measurement for this variance is: (i) cm, (ii)  $\text{cm}^2$ , (iii)  $\text{cm}^3$ , (iv) it is unit-free.
8. When should measures of location and dispersion be computed from grouped data rather than from individual data values? (Choose the correct option)
  - Whenever computer packages for descriptive statistics are unavailable
  - As much as possible since computations are easier
  - Only when the data are from a population
  - Only when individual data values are unavailable
9. The numerical value of the variance can never be
  - Negative
  - None
  - Larger than the standard deviation
  - Zero

10. The numerical value of the standard deviation can never be

- Negative
- None
- Larger than the variance
- Zero