**ST501 {STATISTICS}**

**ASSIGNMENT ONE**

**ISSUED DATE: 16/10/2020**

**DUE DATE: 30/10/2020**

**INSTRUCTIONS: Each student is to complete all five (5) questions.**

**{All answer paper is to be submitted to your class leader before due date}.**

**QUESTION ONE**

Consider a data set of 15 distinct measurements with mean A and median B.

(a) If the highest number were increased, what would be the effect on the median and mean? Explain.

(b) If the highest number were decreased to a value still larger than B, what would be the effect on the median and mean?

(c) If the highest number were decreased to a value smaller than B, what would be the effect on the median and mean? {9 Marks}

**QUESTION TWO**

In this problem, we explore the effect on the mean, median, and mode of multiplying each data value by the same number. Consider the data set 2, 2, 3, 6, 10.

(a) Compute the mode, median, and mean.

(b) Multiply each data value by 5. Compute the mode, median, and mean.

(c) Compare the results of parts (a) and (b). In general, how do you think the mode, median, and mean are affected when each data value in a set is multiplied by the same constant?

(d) Suppose you have information about average heights of a random sample of airplane passengers. The mode is 70 inches, the median is 68 inches, and the mean is 71 inches. To convert the data into centimeters, multiply each data value by 2.54. What are the values of the mode, median, and mean in centimeters? {15 Marks}

**QUESTION THREE**

Given the sample data x: 23 17 15 30 25

(a) Find the range.

(b) Verify that ∑x =110 and ∑X2=2568.

(c) Use the results of part (b) and appropriate computation formulas to compute the sample variance and sample standard deviation.

(d) Use the defining formulas to compute the sample variance s 2 and sample standard deviation s.

(e) Suppose the given data comprise the entire population of all x values. Compute the population variance and population standard deviation

(f) Compute the CV and comment on its result {16 Marks}

**QUESTION FOUR**

A teacher notes the number of correct answers given by a class on a multiple-choice test. Correct answers 1 – 10 11 – 20 21 – 30 31 – 40 41 – 50

Frequency 2 8 15 11 3

(i) Estimate the mean. (ii) Estimate the median. (iii) What is the modal class? {10 Marks}

**QUESTION FIVE**

A bag contains tickets, numbered 11, 12, 13, ...., 30. A ticket is taken out from the bag at random. Find the probability that the number on the drawn ticket

        (i) is a multiple of 7

        (ii) is greater than 15 and a multiple of 5.

A bag contains 5 blue (B) and 3 white (W) marbles and two marbles are selected without replacement. a Draw a tree diagram showing all outcomes and probabilities.

b Find the probability of selecting: i a blue marble followed by a white marble (B, W) ii 2 blue marbles iii exactly one blue marble

c If the experiment was repeated with replacement, find the answers to each question in part b

{15 Marks}