



**School of Information Technology**

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Module : Business Statistics

Topic : Descriptive Statistics

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**Learning Outcomes:**

By the end of this lesson, you should be able to

1. organise a set of data by using tables and diagrams such as frequency table and histogram.
2. describe the central tendency of a set of numerical data by using the mean, median and mode.
3. describe the spread of a set of numerical data by using interquartile range and standard deviation

**Topic: Descriptive Statistics****QUESTION 1**

The following data shows the time spent [in minutes] on surfing the internet at work by a sample of 16 randomly selected employees:

6	4	9	4	8	4	16	14	13	12	10	16	18
16	19	16										

Calculate the:

- (a) mean                      (b) median                      (c) mode
- (d) It was subsequently found that one of the observations shown above was wrongly recorded as 4 when it was actually 16. Without any calculation, state whether the new information will change the value of the median calculated in part (b) above. Briefly explain your answer.

**QUESTION 2**

A department store manager is interested in the number of complaints received by the customer service department about the quality of electrical products sold by the store since the store opened 10 months ago. Records over a 10-month period yield the following data:

18    12    10    16    8    3    13    11    3    13

- (a) Calculate the mean, median and mode.
- (b) Based on the calculated values of the mode in (a), state one disadvantage of the mode as a measure of central tendency.

**QUESTION 3**

The table below shows the weekly sales data of a computer store Defender. The manager of the store aims to achieve high and consistent sales for the store. He will embark on a marketing programme if the mean weekly sale is below \$45000 or the standard deviation of the weekly sales is above \$10000.

Week	1	2	3	4	5	6	7
Sales (\$'000)	45.9	57.8	49.8	66.9	33.8	40.9	30.3

- (a) Calculate the sample mean and standard deviation of the weekly sales of the computer store.
- (b) Explain if the store should embark on the marketing programme.

**QUESTION 4**

The manager of a restaurant wants to estimate the average amount customers spent at the restaurant. A random sample of eight customers is surveyed. The expenditure of each customer is tabulated below.

Customer	One	Two	Three	Four	Five	Six	Seven	Eight
Expenditure (\$)	83.50	48.20	120.80	33.60	90.90	88.60	93.50	67.40

- (a) Compute the sample mean and standard deviation.
- (b) If two more customers with expenditure of \$200 and \$300 are added to sample, without any calculation, state and explain the impact on the additional two customers on the sample mean and standard deviation.

**QUESTION 5**

The annual profit (rounded to millions of dollars) of 12 randomly selected companies in 2018 are as follows:

8	12	7	17	14	45	10	13	17	13	9	11
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Find the values of the range, the three quartiles and the interquartile range.

**SUPPLEMENTARY QUESTIONS****QUESTION 6**

Consider the following set of sample data

6, 8, 14, 4, 3, 5, 11, 12, 5, 10, 11, 5, 11, 12, 5, 18

Calculate the:

- (a) mean      (b) median      (c) mode      (d) standard deviation  
 (e) range      (f) interquartile range

**Answers:**

Q1      (a) 11.563 minutes      (b) 12.5 minutes      (c) 16 minutes

Q2(a) Mean = 10.7 complaints  
 Median = 11.5 complaints  
 Mode = 3 complaints and 13 complaints

Q3       $\bar{X} = 46.486$  (\$'000)  
 $s = 12.976$  (\$'000)

Q4(a)  $\bar{X} = \$78.31$   
 $s = \$27.65$

Q5      Range = 38, Q1 = 9.5, Q2 = 12.5, Q3 = 15.5, IQR = 6

Q6      (a) 8.75      (b) 9      (c) 5      (d) 4.25      (e) 15      (f) 6.5