

SOLUTIONS

King Fahd University of Petroleum & Minerals
Department of Mathematics & Statistics

STAT-319-Term073-Quiz1-B

Name: _____

ID: _____

Sec.: _____

Serial: _____

The following observations represent the weights (in grams) of a manufacturer cans

5.1	5.27	5.29	5.29	5.3	5.34	5.34	5.36	5.39	5.42	5.44	5.46
5.47	5.48	5.53	5.57	5.58	5.62	5.63	5.65	5.68	5.75	5.79	5.85

Given that $\sum x_i = 131.6$, $\sum x_i^2 = 722.4044$ answer the following:

a. Find the sample **mean** and the **standard deviation**

I. Sample Mean $= \bar{X} = \frac{\sum X_i}{n} = \frac{131.6}{24} = 5.4833$ (1-Point)

II. Sample Standard Deviation $= S = \sqrt{\frac{\sum X_i^2 - n(\bar{X})^2}{n-1}} = \sqrt{\frac{722.4044 - 24(5.4833)^2}{24-1}}$ (2-Points)

$$= \sqrt{\frac{0.80650664}{23}} \quad (1\text{-Point})$$

$$= 0.1873 \quad (1\text{-Point})$$

b. Find the inter quartile range (IQR)

I. $Q_1 = P_{25} \Rightarrow \alpha = 25 \Rightarrow R_\alpha = \frac{25}{100} (24+1) = 6.25$ (1-Point)

II. $Q_1 = P_{25} = X_{(6)} + 0.25(X_{(7)} - X_{(6)})$ (2-Points)
 $= 5.34 + 0.25(5.34 - 5.34)$
 $= 5.34$ (1-Point)

III. $Q_3 = P_{75} \Rightarrow \alpha = 75 \Rightarrow R_\alpha = \frac{75}{100} (24+1) = 18.75$ (1-Point)

IV. $Q_3 = P_{75} = X_{(18)} + 0.75(X_{(19)} - X_{(18)})$ (2-Points)
 $= 5.62 + 0.75(5.63 - 5.62)$
 $= 5.6275$ (1-Point)

So, the inter quartile Range $IQR = Q_3 - Q_1 = 5.6275 - 5.34$ (1-Point)
 $= 0.2875$ (1-Point)

c. Construct a stem-and- leaf plot, and **comment** on the shape

51		0				
52		7	9	9		
53		0	4	4	6	9
54		2	4	6	7	8
55		3	7	8		
56		2	3	5	8	
57		5	9			
58		5				

Comment: The data distribution shape is approximately symmetric. (1-Point)