

(marks 7)

4) : Consider the following data

1	2	3	9	9	4	5	6	6	7
9	8	8	7	2	0	6	0	6	4
2	4	0	5	5	6	7	6	6	8
9	8	8	7	7	3	3	4	6	4
2	4	1	5	6	6	7	6	6	8

Then

-3	-1	0	0	0	1	2	2	2	2
3	3	4	4	4	4	4	4	5	5
5	5	6	6	6	6	6	6	6	6
6	6	6	6	7	7	7	7	7	7
7	8	8	8	8	8	9	9	9	9

a) Calculate the percentile P_{45} (mark 1)

$$P_{45} = \frac{r(n+1)}{100} = \frac{45(50+1)}{100} = 22,95 \quad k=22 \quad s=0,95$$

$$P_{45} = x_{22} + 0,95 \cdot (x_{23} - x_{22}) = 5 + 0,95 \cdot (6 - 5) = 5,95$$

b) Calculate the decile D_7 (mark 1)

$$d_7 = \frac{r(n+1)}{10} = \frac{7(50+1)}{10} = 35,7 \quad k=35 \quad s=0,7$$

$$D_7 = x_{35} + 0,7(x_{36} - x_{35}) = 7 + 0,7(7 - 7) = 7$$

c) Calculate the quartiles Q_1 , Q_2 and Q_3 (marks 3)

$$q_k = \frac{50+1}{4} = 12,75 \quad k=12 \quad s=0,75 \quad Q_1 = x_{12} + 0,75(x_{13} - x_{12}) =$$

$$3 + 0,75(4 - 3) = 3,75$$

$$q_2 = \frac{2(50+1)}{4} = 25,5 \quad k=25 \quad s=0,5 \quad Q_2 = x_{25} + 0,5(x_{26} - x_{25}) = 6 + 0,5(6 - 6) = 6$$

$$q_3 = \frac{3(50+1)}{4} = 38,25 \quad k=38 \quad s=0,25 \quad Q_3 = x_{38} + 0,25(x_{39} - x_{38}) =$$

$$7 + 0,25(7 - 7) = 7$$

d) Construct the box plot for the given data (marks 2) $x_L = 9$ $x_S = 3$

extrem value

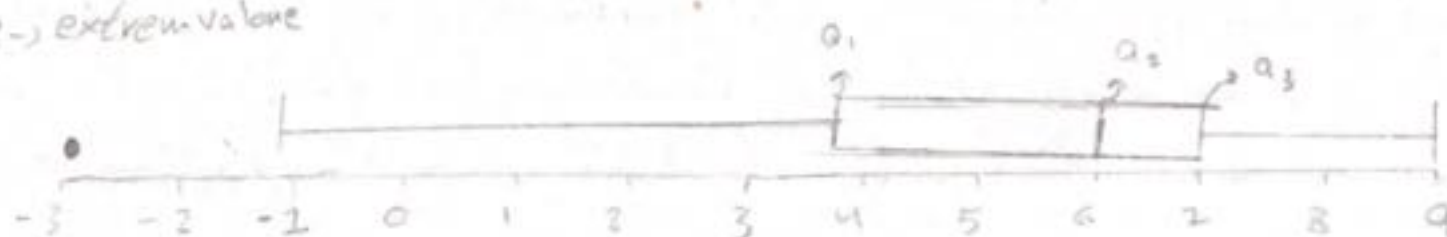
$$= 3,75 - 1,5(7 - 3,75)$$

$$= -1,125$$

$$7 + 1,5(7 - 3,75)$$

$$= 11,88$$

-3- extrem value



Name:
ID Number:
Section:

Second Homework for 101 Stat

(marks 2)

1) Write the name of the best measure of central tendency beside each of the following data sets (the observations have been arranged in ascending order)

(A)	3	?	5	5	6.2	?	7	7.6	8	15	18	(...mode...)
(B)	9	?	12	15	15	20	25	25	35	45	?	(...median...)
(C)	1-	3	4	7	2-	13	15	17	2	4	65	(...median...)
(D)	39	33	34	27	25	31	35	37	37	44	45	(...mean...)

(marks 2)

2) Write the name of the best measure of dispersion beside each of the following data sets (the observations have been arranged in ascending order)

(A)	2	5	5	5	8	1	2	6	4	5	66	(...IQR...)
(B)	5	?	10	11	15	15	17	18	18	20	?	(...IQR...)
(C)	19	12	13	13	15	16	16	20	21	21	22	(...Standard Deviation...)
(D)	3	3	?	7	7	11	15	17	?	21	23	(...Range...)

(marks 9) One degree of each calculation+ (3 marks) for the notice

3) Consider the following two data sets (note that each value of the second data set is obtained by multiplying the corresponding value of the first data set by 3)

Data set X	3	6	9	12	15
Data set Y	9	18	27	36	45

Then calculate the mean, standard deviation, standard score and the coefficient of variation for each of these two data sets. What do you notice

$$\bar{x} = \frac{\sum x}{n} = \frac{45}{5} = 9 \quad \bar{y} = \frac{\sum y}{n} = \frac{135}{5} = 27$$

$$s^2 = \frac{5(495) - (2025)}{20} = 22.5 \quad s = \sqrt{22.5} = 4.74 \quad S^2 = \frac{5(405) - (1225)}{20} = 202.5 \quad S = \sqrt{202.5} = 14.23$$

$$z_{score} = \frac{x - \bar{x}}{s} = \frac{3 - 9}{4.74} = -1.265 \quad z_{score} = \frac{9 - 27}{14.23} = -1.965, \frac{18 - 27}{14.23} = -0.632$$

$$\frac{6 - 9}{4.74} = -0.632, \frac{9 - 9}{4.74} = 0, \frac{12 - 9}{4.74} = 0.632 \quad \frac{27 - 27}{14.23} = 0, \frac{36 - 27}{14.23} = 0.632, \frac{45 - 27}{14.23} = 1.265$$

$$\frac{15 - 9}{4.74} = 1.265 \quad C.V. = \frac{s}{\bar{x}} \times 100 = \frac{14.23}{27} \times 100 = 52.7\%$$

$$C.V. = \frac{s}{\bar{x}} \times 100 = \frac{4.74}{9} \times 100 = 52.7\%$$

$\bar{x}(x) \neq \bar{x}(y)$, $s(x) \neq s(y)$, $C.V.(x) = C.V.(y)$ z-score the number same