Medical Annex of Jijel

Academic Year: 2026–2027 | **Level:** 1^{st} Year Medicine

Series 02: Numerical Description of Data (Statistical Parameters)

Exercise 1

1. Consider the statistical variable X taking the following values: $10, 7, 17, 27, 9, 8, 6, 14$.
   - Calculate Q_1, Q_2 (Me), and Q_3.
2. Consider the statistical variable X taking the following values: $8, 1, 10, 7, 17, 23, 12, 15, 24$.
   - Calculate the mean ($\bar{x}$).
   - Determine the median (Me), Q_1, and Q_3 for this series.
   - Calculate the variance (s^2).
3. Given the statistical variable Z taking the values: $1, 8, 8, 10, 12, 15, 17, 23, 24, 29$.
   - Determine the mode of this series.
   - Calculate Q_1, Q_3, the interquartile range (IQR), and the semi-interquartile range.

Exercise 2

On a soybean plot, the height in cm was measured for 100 plants at the age of 6 weeks. The results obtained are as follows:

Height (x_i)	36	37	38	39	40	41
Frequency (n_i)	6	11	26	27	19	11

1. What is the variable under study, and what is its type?
2. Determine the mean height of a plant.
3. Calculate the mode of this series.
4. Calculate the median Me, Q_1, and Q_3.
5. Calculate the variance and standard deviation of this series.

Exercise 3

The urea concentration was studied in 48 patients. The results obtained are as follows:

Urea Rate (cg)	[20–23[	[23–26[	[26–29[	[29–32[	[32–35[	[35–38[	[38–41[	[41–44[	[44–47[	[47–
Frequencies (n_i)	2	2	4	5	8	11	10	4	1	1

1. What is the variable under study, and what is its type?
2. What is the range of this series?
3. Calculate the mode, median, Q_1, and Q_3.
4. Calculate the mean urea concentration in this sample.
5. Calculate the standard deviation of this distribution.
6. Calculate the interquartile range and the coefficient of variation (CV), then interpret.
7. Perform a graphical verification of Q_1 and Q_3 (using the cumulative frequency curve).
8. Perform a graphical verification of the mode.

Exercise 4

Let X be a continuous quantitative statistical variable whose values are grouped into classes in the following table:

Class	[0, 1]	[1, 2[	[2, 2.5[	[2.5, 3[	[3, 4[	[4, 5[	[5, 10[
Frequency	10	80	120	110	90	70	20

1. Calculate the mean, variance, and standard deviation.
2. Calculate Q_1, Q_2, and Q_3.
3. Calculate the coefficient of variation (CV) and interpret.
4. Calculate the mode.

Quiz / Multiple Choice Questions

Consider the following distribution:

Classes	[4–6[	[6–8[	[8–12[	[12–14[
Frequencies	4	5	8	3

Let σ^2 and Me represent the variance and median respectively.

QCS1) The mean $\bar{x}$ of this distribution is:
a) 5 b) 8.75 c) 48 d) 8.7 e) None of these answers

QCS2) The variance is:
a) 9.18 b) 3.5 c) 9.61 d) 8.91 e) None of these answers

QCS3) The Mode (Mo) and Median (Me) couple of this distribution is:
a) $(Mo; Me) = (7; 8.5)$ b) $(Mo; Me) = (7; 7.6)$ c) $(Mo; Me) = (9.7; 8.5)$ d) $(Mo; Me) = (9.7; 7.6)$

QCS4) If a box plot is drawn, which parameter does NOT appear on the diagram?
a) Q_1 b) σ^2 c) Minimum d) Maximum

QCS5) The coefficient of variation (CV%) of this distribution is:
a) 35.63% b) 34.25% c) 30.11% d) 21.49%

QCS6) If all frequencies of this distribution are multiplied by a factor α, the variance of the new distribution will be:
a) $\alpha\sigma^2$ b) σ^2 c) $\alpha^2\sigma^2$ d) σ^2/α

Returning to the initial distribution, we add a constant β to each class boundary without modifying the frequencies:

QCS7) The median of the new distribution relative to the initial median will be:
a) $Me + \beta$ b) Me (unchanged) c) $Me + 2\beta$ d) Me/β

QCS8) The variance of the distribution obtained relative to the initial variance σ^2 will be:
a) Divided by β b) Doubled c) Multiplied by β d) Unchanged

Returning again to the initial distribution, we multiply each class boundary by a constant γ without modifying the frequencies:

QCS9) The median of the new distribution relative to the initial median Me will be:
a) $Me + \gamma$ b) Me (unchanged) c) $Me \cdot \gamma$ d) Me/γ

QCS10) The variance of the distribution obtained relative to the initial variance σ^2 will be:
a) Unchanged b) Doubled c) Divided by γ d) Multiplied by γ^2

A study on a continuous statistical variable X gave the following results ($N = 120$):

x_i	[0–a[	[a–b[	[b–9[
n_i	x	40	y

QCM1) If the classes have equal widths and $Q_1 = 2$, then the value of x is:
a) 80 b) 40 c) 30 d) 20 e) 45

QCM2) If the classes have equal widths and $Q_1 = 2$, the number of individuals with a value between a and 7 is approximately equal to:
a) 100 b) 51 c) 115 d) 120 e) 105

QCM3) If the classes have equal frequencies, $D_3 = 3.6$ and $C_{60} = 70$, the values of a and b are:
a) $a = 3.5, b = 8.5$ b) $a = 5, b = 8$ c) $a = 4, b = 5$ d) $a = 3, b = 6$ e) $a = 4, b = 7.75$