



Always use 3 decimal places.

GROUP I

1. Assume that you intend to study the market structure of a given product in a given region and with that purpose you collected information on the sales of the different firms in 2010 in that region.

Table: % of firms by sales class in 2010

Sales classes	% firms
Below 15.000€	35
15.000 - 40.000 €	25
40.000 - 100.000€	18
100.000 - 250.000 €	13
250.000 - 500.000€	7
Over 500.000€	2

Source: Own calculations

- (1,00 val) a) Compute the mean and median value of the distribution of sales.
- (0,75 val) b) Compute the standard deviation and the coefficient of variation of the distribution of sales.
- (0,75 val) c) Present the histogram of the distribution and analyse its symmetry, comparing with the conclusions you can draw from the measures compute in a).
- (1,50 val) d) Compute the Gini Index of the distribution of sales and discuss whether you consider that new firms that intend to sell this product in this region can face more or less difficulties.
- (1,5 val) 2. Assuming that in 2000 the values of the mean, median, coefficient of variation and Gini Index of the distribution of sales were, respectively, 55.000€, 30.000€, 1,01 e 0,40 comment the evolution of the distribution of sales between 2000 and 2010.
3. Say, and justify, whether the following sentences are true or false:
- (0,75 val) a) "If one knows that in a given distribution the values of the observations in the last decile are recorded 5% their real value, one can say that both the mean and the median that were computed with those values are 5% below their real value".
- (0,75 val) b) "Considering that in a given year the Government decided to increase all the values of a given social benefit in 3,2% we can say that the mean, the median and the concentration of the distribution increased 3,2%".

GROUP II

1. The sales of a given company were the following:

Table: Sales

	2006	2008	2010
Sales (thousands €)	7.546	11.292	10.162

Source: Firm reports

- (0,75 val) a) If in 2009 sales decreased 3%, compute the annual rate of change of sales in 2010.
- (0,50 val) b) Compute the sales rate of change between 2006 and 2010.
- (0,50 val) c) Compute the annual average sales rate of change between 2008 and 2010.
- (1,00 val) d) If between 2000 and 2006 sales increased at the average annual rate of 2,64%, compute the value of sales in 2000.
- (1,75 val) e) If between 2000 and 2003 sales increased 6% which was the average annual growth rate between 2003 and 2006?

GROUP III

1. The sales value of a given company in 2010 at current prices was 2.450.323€ You also know the following information about the evolution of that company sales:

Table: Evolution of Sales

Year	2005	2006	2007	2008	2009	2010
Value of sales (Rate of change)	3,3	4,3	5,3	1,9	-2,5	2,1
Price Index of sales (2008=100)	91,2	94,8	97,1	100,0	99,1	100,9

Source: Company reports

- (0,75 val) a) Compute, for each year, the 2007 fixed base index of value of sales.
- (0,75 val) b) Compute, for each year, the current value of sales.
- (1,50 val) c) Compute, for each year, the value of sales at 2006 constant prices.
- (1,50 val) d) Compute the value of sales in 2005 at 2009 prices and the value of sales in 2004 at current prices.
- (1,00 val) e) If in 2011, the prices of this company increase 2,3% and quantities sold decrease 0,1%, say which are going to be the values of Sales in that year at current prices and at 2009 prices.

GROUP IV

1. The CEO of a big exporting company knows that its Sales are related to the growth of the economies of its main trading partners. Trying to have a model that allows him to forecast the sales in the following year he intends to estimate the relationship between the Sales growth and GDP growth in its main trading partners. With that purpose he collected historical information on those variables and got the following results:

Average Sales growth = 2,7
Variance Sales growth = 1,235

Average GDP growth of main trading partners = 5,4
Variance GDP growth of main trading partners = 2,143

Covariance between Sales growth and GDP growth of main trading partners = 1,039

- (0,50 val) a) Discuss which is the dependent and which is the independent variable.
- (1,25 val) b) Compute the parameters of the linear regression line and comment the values found and their signal. Discuss in particular whether the company seems to be winning or losing market share.
- (1,25 val) c) Comment the following sentence: "If I have information about the GDP growth in my trading partners and given the equation estimated in b) I can forecast accurately the sales that I will have in the forthcoming year".