

**Always use 3 decimal places.**

**GROUP I**

1. One knows the following information on the distribution of households by income level in a given country.

**Table: Distribution of households by income level**

Income level (€)	% households
0-5.000	23
5.000-15.000	28
15.000-25.000	19
25.000-50.000	13
50.000-100.000	11
>=100.000	6

Source: Statistical office

- (1,50 val) a) Depict graphically the simple and cumulative frequencies of this distribution.
- (1,00 val) b) Compute the mean and median value of the distribution.
- (1,00 val) c) Compute the standard deviation and the coefficient of variation of this distribution.
- (0,50 val) d) Taking into account the measures computed, analyse and explain the behaviour of the distribution in term of symmetry.
- (1,00 val) e) Analyse the behaviour of this distribution using the box and whiskers plot.

2. The following table shows the distribution of income in two countries by quintiles .

- (2,00 val) a) Depict the Lorenz curves, compute the Gini indices and compare the degree of concentration of income in this two countries.

**Table: Indicators of income distribution in two countries**

Quintile	Country A	Country B
1	50%	35%
2	20%	30%
3	15%	25%
4	10%	6%
5	5%	4%
Total	100%	100%

Source: Statistical office

## GROUP II

1. Consider the following information on the evolution of an economic variable.

**Table: Evolution of an economic variable**

Year	2011	2012	2013	2014	2015
<i>Yearly rate of change (%)</i>	3.7	-0.5	1.8	?	1.3

Source: Statistical office

One also knows that the annual average growth rate between 2013 and 2015 was 2.9%.

- (1,50 val) a) Compute for the years from 2010 to 2015 the chain index of this economic variable.  
 (1,00 val) b) Compute the average annual growth rate between 2010 and 2013.  
 (1,00 val) c) Compute the cumulative growth between 2011 and 2013.  
 (1,00 val) d) Knowing that the value of the variable in 2015 was 2200 tonnes compute its value in 2013.

## GROUP III

1. One knows the following information about the evolution of an economic variable.

**Table: Information on the evolution of an economic variable**

	2012	2013	2014	2015
<i>Yearly change at current prices (%)</i>	1.5	1.3	1.1	2.0
<i>Price index (fixed base 2011)</i>	101,0	102,7	103,1	103,5

Source: Statistical Office

One also knows that the value of this variable in 2013 at current prices was 3300 um.

- (1,00 val) a) Compute the 2011 fixed base index of this variable at current prices and tell which was the growth rate between 2011 and 2015.  
 (1,50 val) b) Compute the real growth of this variable between 2013 and 2015.  
 (1,50 val) c) Compute the value of this variable in 2014 at current prices and at previous year constant prices.  
 (1,50 val) d) Compute your forecast for the value of this variable in 2016 at current prices if you expect that prices increase 2% and quantities 1.5% in that year.

## GROUP IV

1. A researcher is assessing the relationship between exports of a given country and economic growth in its trade partner countries. He collected the following information.

**Table: Information on exports of a county and GDP of its trade partners**

<i>Exports (10<sup>9</sup> euros)</i>	128.5	135.8	142.6	146.2	152.4	158.7	166.2
<i>GDP partner countries (10<sup>9</sup> euros)</i>	9 561.5	9 959.0	10 327.3	10 494.5	11 023.8	11 517.0	12 181.9

Source: Statistical office

- (2,00 val) a) Compute the regression line that better represents the relationship between these two variables and comment it.  
 (1,00 val) b) Verify if the relationship between the two variables is strong.