LISBOA
SCHOOL OF
ECONOMICS &
MANAGEMENT
SINCE 1911
1st year
Academic year 2013-2014

Economics and Business Information

Normal examination period
15 January 2014
Duration: 2h30m (150 minutes)

Always use 3 decimal places.

GROUP I

1. A given company decided to study the monthly wage distribution of its employees. The results are as follows, considering the monthly wages in euros for each worker:

Table: Distribution of wages

Monthly wages	Number of workers
500 – 1000	75
1000 - 3000	58
3000 - 5000	22
5000 - 8000	20
8000 - 10000	15
10000 - 20000	10

Source: Department of Human Resources

(1,50 val) a) Depict graphically the simple and cumulative frequencies of the distribution of wages.

(1,00 val) b) Compute the mean and median value of the distribution of wages.

(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.

(1,50 val) e) The head of the human resources department presented a briefing to the management in which he stated: "There might be motivation issues among the workforce as those that earn the highest salaries represent a very high proportion of the wage bill".

Comment the statement making use of the appropriate measures.

(1,50 val) f) Assume that 3 new employees are hired with wages equal to the actual average value. Say and justify what happens to the mean, standard deviation and Gini Index of the distribution.

GROUP II

1. Consider the following information about the quotation of a company stocks.

Table: Stock quotation

(end of period values)

Year	2007	2009	2011	2013
Quotation (euros)	18,39	12,08	11,38	11,89

Source: Management reports

(1,00 val) a) If you know that in 2012 the quotations of the stocks of this company increased 3,34%, which was the rate of change of the quotations in 2013?

(1,00 val) b) Which was the rate of change of the quotations between 2009 and 2013 and which was the average annual rate of change of the quotations between 2007 and 2013?

(1,25 val) c) Which should be the change of quotation of the stocks in 2014 so that an investor that has bought a stock in 2009 gets a total earnings for holding the stock of 3% at the end of 2014.

(1,25 val) d) Knowing that between 2004 and 2007 the quotations changed at an average rate of change 1.2 p.p. higher than that registered between 2011 and 2013, compute the quotation of this company's stock in 2004.

GROUP III

1. One company produces and sells 3 products. The following table presents some information on the evolution of sales of this company.

Table: Information on the evolution of sales

	Sales 2013 (thousand euros)	Index of value of sales 2013 (2012=100)	Index of prices 2013 (2010=100)	Index of prices 2012 (2010=100)
Product A	1610	104,1	104,1	103,1
Product B	1840	102,2	103,2	102,4
Product C	1930	101,4	100,7	101,6

Source: Management reports

(1,00 val) a) Compute for product B the rate of change of prices in 2013.

(1,00 val) b) Compute the value of sales of product A in 2013 at 2010 prices.

(1,00 val) c) Compute the real growth rate of sales of product C in 2013.

(1,00 val) d) Compute the value of sales in 2012 at current and 2010 prices.

(1,50 val) e) Can you compute the Laspeyres index of prices of the products of this company in 2013 with base in 2012? If yes compute it.

GROUP IV

1. In a given company it was decided to analyse the consumption of fuel in a group of trips.

Table: Information on the consumption of fuel

Distance (kms)	100	180	250	300	320	350
Fuel consumption (litres)	3.5	5.6	7.9	8.4	9.3	10.9

Source: Company reports

(2,50 val) a) Compute the regression line that better represents the relationship between these two variables. Comment to what extent the relationship is strong.

(0,50 val) b) How many litres of fuel you estimate would be needed for a trip of 280 km?