Economics and Business Information Analysis

Instituto Superior de Economia e Gestão
UNIVERSIDADE TÉCNICA DE LISBOA

Second exam

1st year
Academic year 2007-2008

31 January 2008
Duration: 2h30m (150 minutes)

Always use 3 decimal places.

GROUP I

1. The distribution of the number of home-textiles exporters in 2006 was the following:

| Classes of exported value (1000 €)	Number of exporters
1000-2000	52
2000-2500	82
2500-3000	91
3000-3500	25
3500-5000	10
Total	**260**

(1,5 val) **a)** Build the histogram and the cumulative frequency line of this distribution.

(1,0 val) **b)** Compute the mean and the median of the distribution. What can you conclude about its symmetry? Justify.

(1,0 val) **c)** Compute the variance and standard deviation of the distribution.

(1,5 val) **d)** Analyse the degree of concentration of textiles exports using the Gini Index. Analyse the result.

2. In a firm that produces beauty products three different products are being tested. They applied an enquiry to some clients to assess the degree of satisfaction with the products. They got the following result:

Degree of satisfaction by product
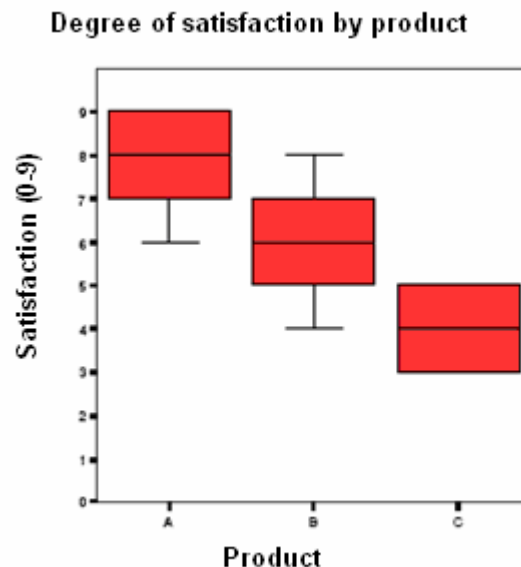
(1,00 val) a) Present the values for distribution A that are coherent with the graphic presented.
(Suggestion: Assume that there were 12 clients that answered the enquiry)

(1,00 val) b) Compare the distribution of A and the other products with respect to its location, dispersion and skewness.

GROUP II

1. In ALFAJOTA region two companies, NOSAE,SA and M.JARTINS, SA, control the retail market with market shares that were in 2003 respectively 60% and 40%.
In the annual reports it was possible to obtain the following information.

Table: Annual sales

		2003	2004	2005	2006
NOSAE, SA	Annual change (%)	5,2	4,5	6,7	8,0
M.JARTINS, SA	Índex (Base = 2002)	104,1	115,9	117,2	122,6

(1,0 val) **a)** Which firm registered the biggest increase of sales in 2006.
(1,5 val) **b)** Compute the sales average growth rate between 2003 and 2006 for each firm.
(1,0 val) **c)** Compute the sales fixed base index of NOSAE,SA , taking 2005 as base year.
(1,0 val) **d)** If M.JARTINS, SA Sales were 45 678 M€ in 2004 and have grown in 2007 at the average rate between 2003 and 2006, what will be the sales value in 2007?
(1,0 val) **e)** Compute the market share for each firm in 2006.

GROUP III

1. Assume that you know the turnover volume and price changes for Novabase in the last few years:

Table: Turnover and price changes for Novabase

Year	2002	2003	2004	2005	2006
Turnover (thousand €)	40 474	62 171	97 593	139 965	154 780
Price change (rate of change %)	3,4%	1,1%	4,0%	3,0%	3,2%

Note: The turnover is a variable that is expressed in current prices.

(1,5 val) **a)** Compute the fixed base index of turnover at 2002 constant prices.
(1,0 val) **b)** Which was the nominal and real rate of change of sales between 2002 and 2006.
(1,0 val) **d)** Compute the turnover in 2004, at 2002 prices.
(1,0 val) **d)** Compute the turnover in 2002, at 2006 prices.

GROUP IV

1. The management of a given firm considers that the level of consumption of photocopy paper is related to the number of computers that are used by its employees. To assess this hypothesis they have the following information.

Year	Number of computers	Number of paper boxes used
2001	10	1000
2002	25	950
2003	50	800
2004	100	200
2005	200	80

(1,5 val) **a)** Compute the covariance and the linear correlation coefficient and explain to which extent they suggest the existence of a linear relation between the variables.
(1,5 val) **b)** Compute the coefficients of the linear regression line and discuss its meaning. What is the expected consumption of paper boxes, if there are 50 extra computers in 2006?