Economics and Business Information

Second examination period
7 July2017
Duration: 2h30m (150 minutes)

1st year
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Always use 3 decimal places.

GROUP I

1. Suppose that you are analysing a public program that supports investment by companies and you have the following information on the distribution of projects by level of investment

Table: Distribution of investment projects by size

Amount of investment (thousand €)	% projects
0 – 2.000	26
2.000– 5.000	38
5.000 – 15.000	21
15.000– 50.000	13
>50.000	2

Source: Program information system

(1,00 val) a) Depict graphically the simple and cumulative frequencies of the 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 the distribution.

(0,50 val) d) Taking into account the measures computed, analyse and explain the behaviour of the distribution in terms of symmetry.

(1,00 val) e) Analyse the behaviour of this distribution using the box and whiskers plot.

(1,00 val) f) Analyse the level of concentration of this distribution.

2. Say and justify whether the following sentence is true:

(1,50 val) "An incentive policy focused on the support to smaller projects will generate a reduction of the mean, median, sattandard deviation and the Gini index of the dsitbuition of projects by size.".

GROUP II

1. Consider the following information on the evolution of resident households' consumption in Portugal.

Table: Value of residents' household consumption (at 2011 prices)

	2006	2010	2016
Residents households consumption (million €)	112 652,5	116 962,1	112 490,6

Source: Nationa statistical office

(1,50 val) a) Knowing that between 2014 and 2016 the residents households' consumption has grown in real terms, 4.9%, compute the average annual growth rate between 2010 and 2014.

(0,75 val) b) Compute the rate of change between 2006 and 2016.

(0,75 val) c) compute the average annual growth rate between 2010 and 2016.

2. Comment the following statement:

(1,50 val) "When infra-annual (monthly, quarterly, bi-annual, etc.) information is analysed the computation of chain, year-on-year, cumulative year on year and average year on year changes provide different views on the evolution of series."

GROUP III

1. Consider the following information on Goods and services exports in Portugal.

Table: Evolution of goods and services exports

	2010	2011	2012	2013	2014	2015	2016
Exports at 2011 prices (million euros)	56438,9	60409,9	62467,2	66831,0	69729,0	73993,8	77273,3
Rate of change of exports at current prices (%)	13,1	12,4	5,1	6	3,1	5	2,3

Source: National statistical office

(1,00 val) a) Compute for the different years the 2010 fixed base index of real change of exports.

(1,00 val) b) Compute for the different years the 2010 fixed base index of price change of exports..

(1,25 val) c) Compute the value of exports in 2015 at current prices.

(1,25 val) d) One expects that in 2017 the real change of exports is going to be 6,3% and that the deflator will grow 1,6%. Compute the value of exports in 2017 at current and previous year prices.

2. Comment briefly the following statement:

(1,00 val) a) "To analyse the evolution of an economic variable is important to distinguish between nominal and real changes.".

GROUP IV

1. In the analysy of the Portuguese economy, a research department is tryiing to assess whether the evolution of imports is related to the evolution of GDP. It got the following information.

Table: Information on GDP and imports in Portugal (at 2011 constant prices)

GDP (million euros)	179 445	176 167	169 070	167 159	168 652	171 341	173 738
Imports (million euros)	72 151	67 952	63 655	66 624	71 809	77 706	81 167

Source: National statistical office

One knows additionally that σ_{PIB} = 4125 and covariance $_{PIB,importações}$ = 6 886 313,0.

(1,75 val) a) Compute the regression line equation that better represents the relationship between these two variables and comment it.

(1,25 val) b) Verify if the relationship between the two variables is strong.