
“Athens” 2009 course, IST, Technical University of Lisbon — 19/November

Exam (simulated) of QUALITY CONTROL

- Solve this open-book Exam in an Excel file and or Word file, etc., or paper.
- Name your files as *your_surname.xls*, etc. (e.g., *citroen.doc*, but not *Citroën.doc*). Send, **with return receipt**, to the **3** following addresses: *mcasquilho@ist.utl.pt*, *athenslisbon@yahoo.co.uk* and *yourself*. In the “subject” write your name. Do not forget to **attach** your files! Do not leave without confirming that the mail has been transmitted.
- Even if you do not use any paper, write your name in a **sheet** and hand it over.
- Duration: **3** hours. (The room must be left before 13h30.)
- Marks will be published on the course Internet page (date will be given there).

If in doubt in English, refer to a dictionary (e.g., Merriam-Webster on the Internet). In general, *concise* answers are expected (in Questions 1 and 2, short answers, from one word to one line).

1) a) In the aftermath of World War II, who was the American Quality guru who, in Japan (with highest civilian honour awarded by the Emperor), found greater receptiveness than in his own country? **b)** (...) **c)** What was the effect of Taylorism on Quality? **d)** Mention a European level entity promoting Quality. **e)** (...) **f)** In a company or organization, who must care about Quality?

2) Once (real story), I went to visit [IPQ](#) (the Portuguese Institute for Quality) and told the secretary that their telephone number was wrong in the national phone book. She just said that was regrettable. What better action would you suggest?

In what follows, where standards may be needed, use the ANSI/ASQC standards.

3) For the Shewhart \bar{X} and s control chart, consider the factor $c_4 = \frac{E(s)}{s}$, from which other factors can be calculated (see GL/03, Problem GL/3-3 and “all (formulas)”^{*}). For a sample of size $n = 3$ (Gaussian variable), obtain this factor:

- a)** From a table and from its formula.
- b)** From a Monte Carlo simulation of 1000 samples.

4) Begin with the following file, to prepare an \bar{X} and R control chart:

<http://web.ist.utl.pt/mcasquilho/acad/cq/secure/chartGL2.3.xls>

In the *data* sheet, use only the first $n = 4$ values in each sample and only the first 15 samples (suppress other values). Describe the steps until having a control chart with adequate control limits, and finally give an estimate of s .

5) Find Example B1 in the course webpage,

<http://web.ist.utl.pt/mcasquilho/acad/cq/>

Instead of the value 205, use 210. Solve the problem by Form 1 and Form 2, describing the most important steps of the procedure.

END ■ (Marks follow)

^{*} <http://web.ist.utl.pt/~mcasquilho/compute/qc/F.chartfactors.php>

Marks:	1)	6	1 each part	30%
	2)	1		5%
	3)	5	a) 1; b) 4	25%
	4)	4		20%
	5)	4	a) 0,5; b) 2,5	20%
	<i>Total:</i>	20		100%

