



Chartered Quality Institute

CQI Examinations January 2014

## Unit 303

### Monitoring and Measuring for Quality (Level 3)

23 January 2014

Time: 9.40 – 12.10  
(2½ hours)

#### Notes for candidates

At 9.30, you have 10 minutes preparation time before the exam begins.  
Your exam booklet will be handed out at 9.40.

Attempt **ALL THREE questions** in **Section A**. Attempt **any TWO** questions from **Section B**.  
If you attempt three or more questions in Section B, only the first two will be marked.

Questions may be attempted in any order. All questions carry equal marks.  
The maximum marks for each part of each question are shown.

Begin each question at the top of a fresh side of paper.  
Do not write in the margins.

If you use any additional sheets (graph paper or additional answer booklet) please  
write your CQI student number, examination name and date on each sheet.

## SECTION A – ANSWER ALL QUESTIONS

### QUESTION 1

A statistical approach requires you to qualify your decision through the collection and analysis of relevant data.

a) Explain what is meant by the above statement.

(5 marks)

b) Describe and explain the process taken in the collection and analysis of data, using a practical example of your choice, to illustrate a statistical approach to decision making.

(15 marks)

### QUESTION 2

In order to investigate a particular quality issue you usually have to identify, collect and analyse some relevant data. There are a number of quality tools that are in common use that can be used to facilitate this task.

a) Name and describe a suitable method that will help you to pinpoint a possible cause of a quality issue of your choice and give an indication of what data to collect. Illustrate your answer with a suitable diagram.

(15 marks)

b) Briefly describe five criteria that you will use in selecting what specific data to collect.

(5 marks)

### QUESTION 3

Data comes from many different sources and these sources can provide different types of data.

a) Provide a definition for each of the following types of data:

- variable
- attribute
- objective
- subjective.

(8 marks)

b) Give an example that is relevant to quality control activities, of each of the four types of data.

(4 marks)

c) Provide an example of how you would record collected data for each of the four data types. Illustrate **one** example with a diagram of the data collection sheet.

(8 marks)

## SECTION B – ANSWER TWO QUESTIONS ONLY

### QUESTION 4

When considering data collection tools it is important that your data is recorded clearly and in a format that others can understand. Check/tally sheets are a simple and effective medium for collecting certain types of data.

- a) Provide descriptions of **two** different types of check/tally sheets, and explain how they are used. Include an illustration of each in your answers. **(16 marks)**
- b) Measles charts are one method of recording collected data as part of in-process inspection. Describe a measles chart and include an illustration of its use in your answer. **(4 marks)**

### QUESTION 5

Data visualisation/analysis is a very important follow-on from data collection. Visualisation/analysis of your data will help you to decide your next step.

- a) What is meant by 'data visualisation' and explain how it is used? **(8 marks)**
- b) Explain, with the use of an illustration of each, two simple tools that can be used for data visualisation/analysis. **(12 marks)**

### QUESTION 6

Techniques like statistical process control (SPC) can be used to monitor the output of a process. The following table contains measurements from a process output taken at regular intervals. The length should be 10 mm + or – 0.2 mm.

Sample No.	Length (mm)
1	10.09
2	9.99
3	10.00
4	10.00
5	10.05
6	9.95
7	10.10
8	10.15
9	10.20
10	10.20
11	10.30
12	10.35
13	10.40
14	10.40
15	10.45
16	10.50
17	10.50
18	10.90
19	10.99
20	11.00

- a) Plot the data in the table above, including all information provided. **(10 marks)**
- b) Provide an interpretation of what is going on in the process and what action should be taken. **(10 marks)**

## QUESTION 7

Having investigated a quality issue, you have decided that the collection of performance data is required in a particular aspect of your product or service.

List five advantages and five disadvantages of the following approaches:

a) Using previously recorded data, eg. customer complaints, late deliveries.

**(10 marks)**

b) The collection of specific new data for a set period of time, eg. process time, customer feedback.

**(10 marks)**