

(b) Understanding the difference between special cause and common cause variables is key to any process improvement actions. Explain what these two terms mean. In your explanation include **two** examples of each type.

(6 marks)

(c) Scatter diagrams can be used to examine factors which may influence process variation. Using illustrations show how these diagrams are used and may be interpreted. In your answer, explain the meaning of correlation in reference to their use.

(6 marks)

## QUESTION 6

Given the correct support and environment, quality improvement teams are able to impact business performance significantly and also put in effective measures to consolidate improvement 'gains'.

(a) Discuss the importance of the following factors to the success of any team based improvement project:

- 1) Definition and scope of team goals
- 2) Team training
- 3) Team membership and selection criteria
- 4) Systems and culture to consolidate improvements.

(12 marks)

(b) Discuss **four** reasons why senior management support is a key factor in the success of any quality improvement project.

(8 marks)

## QUESTION 7

In the design of any new product, early identification and reduction or elimination of potential failures is key to a successful launch. FMEA is an established and powerful tool which aims to impose a structured approach to failure risk identification and reduction.

(a) Describe how you would run an FMEA exercise. Include in your answer a typical output in the form of an FMEA template/chart showing **two** potential failure modes of your choice.

(14 marks)

(b) Name and explain **two** factors which may limit the effectiveness of any FMEA exercise.

(6 marks)



Chartered Quality Institute

CQI Examinations June 2014

## Unit 305

### Using Quality to Improve Business Performance (Level 3)

27 June 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 (i.e. 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

The seven basic tools of quality are an established group of tools that can be easily learned and applied by teams or individuals to support quality improvement initiatives.

(a) Illustrate the following three tools and clearly explain how they would be used both to display data and to identify improvement opportunities:

- 1) Pareto Charts
- 2) Check sheets
- 3) Histograms

(12 marks)

(b) The Cause and Effect or Ishikawa diagram is a key tool used in problem solving. Illustrate this tool and explain how it could be used by a quality improvement team.

(8 marks)

### QUESTION 2

Process mapping is a well-established technique used in many industries. It utilises standard and recognised symbols laid out in logical order to show the flow of an operation or process.

(a) Discuss **three** benefits an organisation may gain through comprehensive mapping of its business processes.

(9 marks)

(b) Using recognised symbols map a business process of your choice with which you are familiar. The process should involve interactions between multiple functions or departments and swim lanes used to show interactive boundaries.

(11 marks)

### QUESTION 3

As Company Quality Manager you have been asked to investigate a quality issue and have chosen to start the investigation by gathering a team to carry out a brainstorming exercise.

(a) Discuss the importance of defining the issue and scope of the exercise to your team. Include in your answer any quality tools or graphical representations you might use to explain the background to the issue in order to make this stage more effective.

(6 marks)

(b) Describe how you would run the brainstorming session including how you would select your team. In completing the exercise discuss, how you would use an Affinity diagram to rationalise and group the output.

(10 marks)

(c) Briefly explain **two** factors that can make a brainstorming session less effective.

(4 marks)

## SECTION B – ANSWER TWO QUESTIONS ONLY

### QUESTION 4

You are a newly appointed Quality Manager and have been asked to lead a formal, team-based, quality improvement project in your organisation to address deterioration in either product quality or customer service. You choose a DMAIC approach to this project.

Naming an issue of your choice, describe the stages you would lead your team through in running this approach. Make reference to all the quality tools and techniques you would utilise at each stage and why you feel they are appropriate.

(20 marks)

### QUESTION 5

Process variability is a key factor that requires understanding and analysis in the manufacture of a product or delivery of a service. Various quality tools and analysis techniques are available to allow a trained quality professional to understand and improve the output of a given process, the most commonly used example being the control chart.

(a) Discuss how a control chart is used to display and analyse any continuous process. Illustrate your answer with examples as appropriate.

(8 marks)