

# Cork Institute of Technology

Higher Certificate in Science in Applied Biosciences - Award

(NFQ – Level 6)

Summer 2007

## Quality Management Systems & Biocomputing

(Time: 2 Hours)

Answer FOUR questions. Answer Question 1  
(compulsory) and ONE other question from  
Section A and TWO questions from Section B

Examiners: Ms. A. Ward  
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### Section A

#### Q1. (Compulsory)

1. “Of all the tools for analyzing data, the control chart is the most useful. No other tool captures the voice of your process better. Control charts are used to determine whether your process is operating in statistical control”.

Discuss this statement in relation to:

- i. X-R Control charts (7 marks)
- ii. Distribution A-C (ie. changes in production processes) that can be tracked using an X-R control charts (6 marks)
- iii. Abnormalities that can occur with data on an X-R control charts, (7 marks)
- iv. The purpose of other types of control charts ( $p$  and  $pn$  control charts) (5 marks)

NOTE: Diagrams must be used throughout your answer.

Q2. As a scientist you have been asked to track, trouble shoot and solve a production process problem that exists in the bulk manufacture of yoghurts in a food company. Over the past 2 months, 40 % of all yoghurts produced and supplied to supermarkets have being returned due to inconsistent taste and presentation issues. Using the seven quality control diagrams listed below, write an essay on how would go about solving this production issue.

- i. Pareto Diagrams,
- ii. Histograms,
- iii. Scatter Diagrams,
- iv. Check sheets,
- v. Pictorial graphs,
- vi. Cause and Effect Diagrams,
- vii. X-R Control Charts

NOTE: Diagrams must be used throughout your answer. (25 marks)

- Q3. (a) Explain the purpose of collecting and presenting data in a manufacturing organization. What quality diagrams can be used to assess the consistent production of a product? Include schematic diagrams in answer. (15 marks)
- (b) Why are good communications, computer and interpretation skills essential amongst all workers within an organization? What role does team-work play in the troubleshooting of production problems/issues? (10 marks)

## Section B

- Q4. (a) List TWO examples of each of the following quality cost categories:
- (i) Cost of conformance (Prevention) (4 marks)
  - (ii) Cost of non-conformance (Failure) (4 marks)
- (b) Write a brief note on the use of quality cost index calculations for measuring quality costs. (7 marks)
- (c) Describe with the use of a diagram the traditional economic model for quality of conformance. (10 marks)

Q5. Write a brief overview of TWO of the following:

- (a) Training for Quality
- (b) Quality Manual
- (c) Performance and Operation of a Quality Circle
- (d) Quality Audits

(25 marks)

Q6. (a) Define each of the following terms:

- (i) Quality of Design (3 marks)
- (ii) Quality of Conformance (3 marks)
- (iii) Quality of Performance (3 marks)

(b) Outline the role of the design department and the seven basic stages in the design process, used by an organisation to ensure good quality of design.

(16 marks)