



NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY
DEPARTMENT OF APPLIED CHEMISTRY
BACHELOR OF SCIENCE HONOURS DEGREE
SUPPLEMENTARY EXAMINATIONS – AUGUST 2014
QUALITY ASSURANCE MANAGEMENT AND CONTROL – SCH 2211
TIME: 3 HOURS

Instructions to candidates

Answer **All** Questions from Section A and **any three (3)** from Section B. Section A carries forty (40) marks and each question in Section B carries twenty (20) marks.

Start your answers to each question on a new page. This paper comprises 4 printed pages including the attachment.

SECTION A [Answer All Questions from this Section. This Section carries forty (40) marks].

Study the attached case and answer all the questions that follow.

1. (a) Analyze Bigolov's dilemma. (10 marks)
- (b) Why is Bigolov scared of ISO 9000 implementation? (6 marks)
- (c) In which ways would ISO 9000 ensure that a firm supplies goods and services of world class standard? (8 marks)
- (d) Identify principles and/or practices that distinguish ISO 9000 with TQM. (6 marks)
- (e) Suggest how Advanced Laser Technology should proceed with their ISO 9000 implementation. (10 marks)

SECTION B [Answer any three (3) questions from this Section. Each question carries twenty (20) marks].

2. (a) Mistake-Proof This:

The far-sighted instructor in a rush to get to work on time often forgot and left his glasses at home. Propose a change that will ensure the instructor does not forget his glasses.

(6 marks)

- (b) Explain the five steps of benchmarking (10 marks)
- (c) What are the Crosby's absolutes of Quality? (4 marks)

3. You have been appointed project manager for TQM. One of the main functions of TQM project manager is to develop a detailed TQM implementation plan, process improvement and value to the organization. Explain how you will be instrumental in the company achieving, perpetuating and institutionalizing TQM (20 marks)

4. (a) Explain the concept of six sigma. (5 marks)

(b) What do you understand by "Quality is free"? (5 marks)

(c) How can PDCA be implemented at your university. (10 marks)

5. The following is data of pH for a solution in a mixing tank.

a)

SAMPLE	1	2	3	4	5
1	5.02	5.01	4.94	4.99	4.96
2	5.01	5.03	5.07	4.95	4.96
3	4.99	5.00	4.93	4.92	4.99
4	5.03	4.91	5.01	4.98	4.89
5	4.95	4.92	5.03	5.05	5.01
6	4.97	5.06	5.06	4.96	5.03
7	5.05	5.01	5.10	4.96	4.99
8	5.09	5.10	5.00	4.99	5.08
9	5.14	5.10	4.99	5.08	5.09
10	5.01	4.98	5.08	5.07	4.99

Use the variable control charts to determine whether the process is under control. (11 marks)

b) Three ice cream packing machines at the Creamy Treat Company are being evaluated for their capability. The following data are recorded:

Packing Machine Standard Deviation

- A 0.2
 B 0.3
 C 0.05

If specifications are set between 15.8 and 16.2 ounces, determine which of the machines are capable of producing within specifications. (5 marks)

- c) Draw two graphs one showing process capable of always meeting design specifications and the other showing process meeting capability some of the times.

(4 marks)

..... *THE END*

The case

Advanced Laser Technology, Inc.

Determining Control Limits for \bar{x} -bar and R -Charts

SAMPLE SIZE n	FACTOR FOR \bar{x}-CHART A_2	FACTORS FOR R-CHART	
		D_3	D_4
2	1.88	0.00	3.27
3	1.02	0.00	2.57
4	0.73	0.00	2.28
5	0.58	0.00	2.11
6	0.48	0.00	2.00
7	0.42	0.08	1.92
8	0.37	0.14	1.86
9	0.44	0.18	1.82
10	0.11	0.22	1.78
11	0.99	0.26	1.74
12	0.77	0.28	1.72
13	0.55	0.31	1.69
14	0.44	0.33	1.67
15	0.22	0.35	1.65
16	0.11	0.36	1.64
17	0.00	0.38	1.62
18	0.99	0.39	1.61
19	0.99	0.40	1.61
20	0.88	0.41	1.59

PLASMA**Advanced Laser Technology, Inc.**

Punita Bigolow and her husband have a small, highly successful firm that serves a narrow niche of medical applications of laser technologies. The firm has only four customers, but each is a leading player in the emerging medical-electronics technology markets. Each firm has told Bigolow that it is pleased with her product, service, and ability to provide leading edge technology.

Bigolow's problem begins in the form of a memo. One of her major customers has just decided to seek ISO 9000 certification. As the customer has grown, it needs ISO 9000 certification to effectively compete in international markets. Bigolow understands this logic so far.

The next paragraph reads:

As part of our ISO 9000 certification process, we will expect each of our key suppliers to become ISO 9000 certified. While we realize that this may impose some hardships on you, we are firmly convinced that the end result will be goods and services of world class quality.

What little Bigolow knows about ISO 9000 is that this new requirement would pose an enormous problem for Advanced Laser Technology. Her firm has five employees: herself, her engineer husband, two technicians, and one secretary. How will ALT be able to document all that it did?

It seems to be a catch-22 situation. If Bigolow and her husband divert their attention to document all 20 aspects of Section 4 of ISO 9000, then the firm risks losing its competitive edge in this fast-changing technological field. If ALT hires a consultant to help with this certification process, it risks diverting both management attention and critical cash resources. As she reflects on this dilemma, Bigolow wonders, "How does this add value?"