

**NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY**  
**DEPARTMENT OF APPLIED CHEMISTRY**  
**END OF SEMESTER EXAMINATIONS – JANUARY 2004**  
**QUALITY ASSURANCE MANAGEMENT AND CONTROL – SCH 4111**  
**TIME – (3) THREE HOURS**

**INSTRUCTIONS TO CANDIDATES**

Answer **ANY FIVE (5)** questions from the **SIX (6)** provided. Each question carries 20 marks)

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1. (a) Describe the elements of a Quality Cycle. (6 marks)  
(b) How would you carry out a need analysis for a given customer? (6 marks)  
(c) Describe the requirements of control of incoming material in ISO 9000. (8 marks)
  
2. (a) What do you understand by the term "*Cost of Quality*"? (6 marks)  
(b) How can quality costs be managed? (6 marks)  
(c) Describe the process of vendor/supplier verification in an ISO 9000 certified company. (8 marks)
  
3. Discuss the following statistical quality control tools:  
(a) Check Sheets  
(b) Pareto Analysis  
(c) Cause and Effect Analysis  
(d) Force-field Analysis  
(e) Histograms (20 marks)
  
4. The following were results of pH of four (4) different water samples taken over a 10 day period:

	Days									
	1	2	3	4	5	6	7	8	9	10
Sample 1	5,8	5,5	5,9	5,9	5,9	5,8	5,8	5,9	5,5	5,9
Sample 2	5,3	5,0	5,1	5,0	5,4	5,0	5,2	5,2	5,1	5,4
Sample 3	5,7	5,2	5,4	5,6	5,7	5,3	5,6	5,6	5,2	5,7
Sample 4	5,6	5,6	5,2	5,5	5,8	5,1	5,4	5,7	5,4	5,8

4. (a) Calculate the upper and lower control limits for the mean and range. (8 marks)
- (b) Draw the mean and range charts for these results. (8 marks)
- (c) Comment on the state of control of the variable. (4 marks)
5. (a) Compare and contrast the approaches to quality of the three American Quality gurus, W Edwards Deming, Joseph M Duran and Philip B Crosby. (16 marks)
- (b) What lessons were learnt from each of these gurus? (4 marks)
6. You have recently been appointed Quality Assurance Manager of M and B Manufacturers, a fertilizer manufacturing company.
- (a) Outline your responsibility in the form of a job description. (10 marks)
- (b) Outline your plan of action over the first twelve (12) months in office. (10 marks)

***END OF QUESTION PAPER!!!***

**TABLE A: CONTROL CHART FACTORS**

n	A	A2	A3	c1	d2	D3	D4	B3	B4
2	2.121	1.880	2.659	0.7979	1.128	0	3.267	0	3.267
3	1.732	1.023	1.954	0.8862	1.693	0	2.575	0	2.568
4	1.500	0.729	1.628	0.9213	2.059	0	2.282	0	2.266
5	1.342	0.577	1.427	0.9400	2.326	0	2.115	0	2.089
6	1.225	0.483	1.287	0.9515	2.534	0	2.004	0.030	1.970
7	1.134	0.419	1.182	0.9594	2.704	0.076	1.924	0.118	1.882
8	1.061	0.373	1.099	0.9650	2.847	0.136	1.864	0.185	1.815
9	1.000	0.337	1.032	0.9693	2.970	0.184	1.816	0.239	1.761
10	0.949	0.308	0.975	0.9727	3.078	0.223	1.777	0.284	1.716