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SF-8171

B. E. - II (Sem - IV) (CHEM) Examination

May / June – 2011

Fundamentals of Quality Management

(New Course)

Time : Hours] [Total Marks : **100**

Instructions :

(1)

નીચે દર્શાવેલ ☛ નિશાનીવાળી વિગતો ઉત્તરવહી પર અવશ્ય લખવી.
Fillup strictly the details of ☛ signs on your answer book.

Name of the Examination :

☛ **B. E. - II (Sem - IV) (Chem.)**

Name of the Subject :

☛ **Fundamentals of Quality Management (New)**

☛ Subject Code No. : **8 1 7 1** ☛ Section No. (1, 2,.....) : **Nil**

Seat No. :

Student's Signature

(2) Attempt all questions.

(3) Figures to the right inidcate full marks.

(4) Charts and tables are permitted.

1 Answer the following : **20**

(1) How the quality and quality assurance define ?

(2) Define strategic quality management.

(3) What is Juran's quality triology ?

(4) List the deming's 14 points for TQM ?

(5) Explain the importance of acceptance sampling.

(6) What is an OC curve ?

(7) Comparison between X and R chart.

(8) What is specification limit and control limit ?

(9) Define poission's probability distribution.

(10) What are the two ways of monitoring the variation ?

2 Answer any **three** : **15**

(1) What is TQM ? What is deming's PDCA cycle ?

(2) What are the conditions required for using the chain sampling plan ?

(3) Explain the five phases of SQM with the help of schematic diagram.

(4) Define AOQ and ATI. Derive their expression of single sampling plans by attributes.

(5) What is an ideal curve ? Explain produce's risk and consumer's risk.

3 Solve any **two** : **15**

(1) The following table shows the averages and ranges of the length of work piece in millimetre for 30 sub group of 5 item each :

$\overline{X}$	R	$\overline{X}$	R	$\overline{X}$	R
35.020	0.375	35.600	0.275	35.260	0.150
34.950	0.450	35.020	0.175	35.650	0.200
35.480	0.450	35.320	0.230	35.620	0.300
35.320	0.130	35.560	0.425	35.480	0.225
35.280	0.200	35.140	0.250	35.380	0.125
35.820	0.250	35.620	0.375	35.660	0.350
35.580	0.265	35.800	0.475	35.460	0.225
35.400	0.475	35.500	0.210	35.640	0.375
35.660	0.455	35.780	0.275	35.390	0.550
35.680	0.275	35.640	0.225	35.290	0.350

For the first 20 samples setup an $\overline{X}$ chart and R chart. Plot the next 10 samples on these charts to see if the process continuous "under control" both as to average and range. Also find the process capability.

(2) The following table gives the numbers of missing nut-bolts noted at assembly parts final inspection.

Assembly Part No.	*No.of Nut – Bolts*	*Assembly Part No.*	*No.of Nut – Bolts*	*Assembly Part No.*	*No.of Nut – Bolts*
1	12	10	11	19	11
2	16	11	23	20	9
3	17	12	14	21	10
4	19	13	11	22	22
5	9	14	25	23	9
6	16	15	13	24	28
7	9	16	9	25	7
8	7	17	9		
9	21	18	14		

Find $\overline{C}$ compute trial control limits, and plot control chart for C. What values of C' would you suggest for the subsequent period ?

(3) Derive the expression for the UCL and LCL for acceptance control charts.

Table B

Factors for Estimating σ' from $\bar{R}$ or $\bar{\sigma}$

Number of observations in sub-group n	*Factor for estimate from* R $d_2 = R/\sigma'$	*Factor for estimate from* σ $c_2 = \bar{\sigma}/\sigma'$
2	1.128	0.5642
3	1.693	0.7236
4	2.059	0.7979
5	2.326	0.8407
6	2.534	0.8686
7	2.704	0.8882
8	2.847	0.9027
9	2.970	0.9139
10	3.078	0.9227
11	3.173	0.9300
12	3.258	0.9359
13	3.326	0.9410
14	3.407	0.9453
15	3.472	0.9490
16	3.532	0.9523
17	3.588	0.9551
18	3.640	0.9576
19	3.689	0.9599
20	3.735	0.9619
21	3.778	0.9638
22	3.819	0.9655
23	3.858	0.9670
24	0.895	0.9684
25	3.931	0.9696
30	4.086	0.9748
35	4.213	0.9784
40	4.322	0.9811
45	4.415	0.9832
50	4.498	0.9849
55	4.573	0.9863
60	4.639	0.9874
65	4.699	0.9884
70	4.755	0.9892
75	4.806	0.9900
80	4.854	0.9906
85	4.898	0.9912
90	4.939	0.9916
95	4.978	0.9921
100	0.015	0.9925

Table C

Factors for Determining from $\bar{R}$ the 3-Sigma Control Limits for $\bar{X}$ and R Charts from $\bar{R}$

Number of observations in sub-group	*Factor for $\bar{X}$ chart*	*Factor for R chart*	
		Lower control limit	*Upper control limit*
n	A_2	D_3	D_4
2	1.88	0	3.27
3	1.02	0	2.57
4	0.73	0	2.28
5	0.58	0	2.11
6	0.48	0	2.00
7	0.42	0.08	1.92
8	0.37	0.14	1.86
9	0.34	0.18	1.82
10	0.31	0.22	1.78
11	0.29	0.22	1.74
12	0.27	0.28	1.72
13	0.25	0.31	1.69
14	0.24	0.33	1.67
15	0.22	0.35	1.65
16	0.21	0.36	1.64
17	0.20	0.38	1.62
18	0.19	0.39	1.61
19	0.19	0.40	1.60
20	0.18	0.41	1.59

Table G

Summation of Terms of Poisson's Exponential Binomial Limit 1,000 × probability of c or less occurrences of event that has average number of occurrences equal to c' or np'

c / c' or np'	0	1	2	3	4	5	6	7	8	9
0.02	980	1,000								
0.04	961	999	1,000							
0.06	942	998	1,000							
0.08	923	997	1,000							
0.10	905	995	1,000							
0.15	861	990	999	1,000						
0.20	819	982	999	1,000						
0.25	779	974	998	1,000						
0.30	741	963	996	1,000						
0.35	705	951	994	1,000						
0.40	670	938	992	999	1,000					
0.45	638	925	989	999	1,000					
0.50	607	910	986	998	1,000					
0.55	577	894	982	998	1,000					
0.60	549	878	977	997	1,000					
0.65	522	861	972	996	999	1,000				
0.70	497	844	966	994	999	1,000				
0.75	472	827	959	993	999	1,000				
0.80	449	809	953	991	999	1,000				
0.85	427	791	945	989	998	1,000				
0.90	407	772	937	987	998	1,000				
0.95	387	754	929	984	997	1,000				
1.00	368	736	920	981	996	999	1,000			
1.1	333	699	900	974	995	999	1,000			
1.2	301	663	879	966	992	998	1,000			
1.3	273	627	857	957	989	998	1,000			
1.4	247	592	833	946	986	997	999	1,000		
1.5	223	558	809	934	981	996	999	1,000		
1.6	202	525	783	921	976	994	999	1,000		
1.7	183	493	757	907	970	992	998	1,000		
1.8	165	463	731	891	964	990	997	999	1,000	
1.9	150	434	704	875	956	987	997	999	1,000	
2.0	135	406	677	857	947	983	995	999	1,000	

4 Answer the following : **20**

(1) Define 'Benchmarking'.
(2) How 'Voice of customers' is obtained in QFD ?
(3) What are quality standards ?
(4) Name any four matrices used for software quality measurement.
(5) Write benefits of ISO 9000 certification.
(6) Write various steps in 'Benchmarking' process.
(7) Define 'Quality audit'.
(8) Classify the 'services'.
(9) How 'services' differ from 'products' ?
(10) What is histogram ? How it is useful ?

5 Answer any **two** : **10**

(1) Write the benefits of quality function deployment.
(2) Discuss the role of softwares in quality management system.
(3) Explain 'Deming prize award'.
(4) Explain golden rules for objective evidence in ISO 9000 audits.

6 Answer any **two** : **20**

(1) Explain quality related priorites of Indian companies.
(2) Write short note on 'ISO 14000'.
(3) Explain about malcom baldrige national quality award.
