TOTAL QUALITY MANAGEMENT & ASSURANCE
(CHEN 4282)

Time Allotted : 3 hrs **Full Marks : 70**

Figures out of the right margin indicate full marks.

Candidates are required to answer Group A and any 5 (five) from Group B to E, taking at least one from each group.

Candidates are required to give answer in their own words as far as practicable.

Group – A
(Multiple Choice Type Questions)

1. Choose the correct alternative for the following: **10 × 1 = 10**

(i) The normal distribution is a _____ distribution.
(a) Discrete (b) Continuous
(c) Virtual (d) Skewed

(ii) The PDCA Cycle also means
(a) Deming Cycle (b) Linde Cycle
(c) Carnot Cycle (d) Kaizen

(iii) SA 8000 series is related to Certification of _____ Standard.
(a) Social accountability (b) Environmental management
(c) Quality management (d) Occupational health & safety

(iv) In TQM Muda (無駄) means
(a) Futility (b) Value addition
(c) Beautiful (d) Expensive

(v) In TQM Kaizen means
(a) deplorable condition (b) corporate planning
(c) continuous improvement (d) charitable movement

(vi) For calculation of control limits In Variable Control Chart, Standard Deviation is substituted by:
(a) X-bar- bar (b) Range Average
(c) Variance (d) Staistic-t

(vii) Identify the Scientist who was not associated with TQM.
(a) Deming (b) Juran
(c) Shewhart (d) Tesla

(viii) Identify the synonym of Type II error.
(a) Consumer's Risk (b) Producer's Risk
(c) Quality Control Professional's Risk (d) Benefit of Everyone

(ix) Mil—Std 105 is used in
(a) Quality Circle (b) Acceptance Sampling
(c) Control Chart (d) Production Planning

(x) Fish-bone diagram is another name of
(a) PI diagram (b) Network diagram
(c) Ishikawa diagram (d) Pareto diagram

Group – B

2. (a) How to set your Organizational Goal? Explain with examples.

(b) What is Kaizen? Discuss the salient aspects of Gemba principles

6 + (1 + 5) = 12

3. (a) Let X be a continuous with p.d.f.:

$$f(x) = \begin{cases} ax, & 0 =< x =< 1 \\ a, & 1 =< x =< 2 \\ -ax + 3a, & 2 =< x =< 3 \end{cases} \quad or\ 0,\ elsewhere$$

Determine the constant α.

(b) For a series of data points obeying Binomial Distribution, Prove that,
μ_{np}= E(r)=np
where symbols stand for usual notations.

6 + 6 = 12

Group – C

4. An automatic continuous blending process needs to be controlled for the acidity of the output measured in pH. The following samples were taken:

Sample No	Values of pH
1	5.32, 5.86, 5.38, 5.28, 5.41
2	5.40, 5.33, 5.37, 5.30, 5.40
3	5.34, 5.27, 5.29, 5.35, 5.33
4	5.29, 5.32, 5.31, 5.40, 5.39
5	5.31, 5.27, 5.38, 5.36, 5.40
6	5.61, 5.77, 5.59, 5.49, 5.46
7	5.40, 5.61, 5.37, 5.30, 5.42
8	5.34, 5.21, 5.29, 5.35, 5.24
9	5.87, 5.73, 5.48, 5.40, 5.57
10	5.38, 5.32, 5.38, 5.36, 5.40

Construct suitable process mean and range charts for the system with the help of the following table:

Sample Subgr. Size	A_1	A_2	D_3	D_4
2	3.76	1.88	0	3.27
5	1.60	0.58	0	2.11

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5. (a) What is Acceptance Sampling? Discuss the major three concepts of Taguchi Method.

   (b) Shipments of metal castings arrive in batches of 500 castings each. The inward inspection involves testing which could be destructive and, therefore, a sample 20 items is taken. A batch is accepted only if one or nil of the items in the sample is found to be defective. Under this sampling plan, calculate the probability of rejecting a shipment that has 2 per cent defectives using the Poisson table of approximation.

(2 + 3) + 7 = 12

Group – D

6. Enumerate five type B techniques for improvement in TQM. Discuss the need for carrying out SWOT analysis in an organization. What are its operational guidelines?

5 + 2 + 5 = 12

7. What is the role of Steering Committee in a Quality Circle? A Q.C. was formed in your working place. In the first meeting an effective brainstorming was conducted and the circle identified a problem pertaining to the same work area. In a next meeting the members identified 20 causes of the selected problem under four sub-heads. Considering you to be the leader of the circle present this case study and draw an Ishikawa diagram.

2 + 5 + 5 = 12

Group – E

8. Describe in details the factors which have enabled the Mumbai *Dabbawallahs* to achieve the Six Sigma distinction?.

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9. A process engineering industry has retained you as a consultant for preparation and Mock Audit for ISO 14000 certification. Please prepare the detailed activity chart for this operation.

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Department & Section	Submission Link
BT/CE/ECE/EE	https://classroom.google.com/c/Mjk5ODUxODc1MzQ5/a/MzYwMDQ4NzU5OTkx/details