INDUSTRIAL TOTAL QUALITY MANAGEMENT
(CHEN 4126)

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)   Which of the following is not a measure of dispersion?
           (a) Range   (b) Mean deviation
           (c) Mean   (d) Standard deviation

    (ii)   The height of a tank measured by five engineers is 5 m, 4 m, 4.5 m , 4.5 m, 5 m.
           What is the mode of the calculated values?
           (a) 4.5 m   (b) 4 m   (c) 5 m   (d) 4.5 m and 5 m

    (iii) The control chart that determines the fraction of rejected parts as non-conforming is
           (a) R-chart   (b) S-chart   (c) P-chart   (d) C-chart

    (iv)   p chart belongs to
           (a) Variable control chart   (b) Attributes control chart
           (c) Both (a) & (b)   (d) None of these.

    (v)   Identify the Plan not related to Acceptance Sampling
           (a) Dodge – Romig   (b) Mil—Std 105
           (c) PPP   (d) ChSP

    (vi)   Cause-Effect diagram is another name of
           (a) TQM diagram   (b) Network diagram
           (c) Fish-bone diagram   (d) Pareto diagram

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

    (viii) Identify the type A technique among the following:
           (a) Brainstorming   (b) Stratification
           (c) Pareto Analysis   (d) SWOT Analysis

(ix)   Which of the following is not a measure of central tendency?
         (a) Range   (b) Mean   (c) Median   (d) Mode

(x)   The expected value of a random variable which has the following probability distribution is

X	2	4	6	8	10
P	0.1	0.3	0.4	0.1	0.1

         (a) 5.2   (b) 5.4   (c) 5.6   (d) 5.8

Group- B

2. (a) Define the following:
         i) Normal distribution
         ii) Probability plot.   [(CO1) (Remember/LOCQ)]

    (b) Analyze the status of bottom line of a TQM centric organization.
                                                          [(CO1) (Analyze/IOCQ)]

    (c) What is the vision of Heritage Institute of Technology.[(CO1)(Remember /LOCQ)]
                                                          (3 + 3) + 3 + 3 = 12

3. (a) Find out mean, median, mode, range & variance for the weights of 7 people.
         Their weights are 83,91,78, 80, 83, 85and 87 kilograms.
                                                          [(CO2)(Evaluate/HOCQ)]

    (b) Draw the organizational Structure of a process industry and evaluate its various
         aspects.   [(CO1) (Evaluate/HOCQ)]
                                                          6 + 6 = 12

Group – C

4. Plot the Range Control chart for the data given in Table 1.[Given d_2=2.326 and d_3= 0.864.]
    Table:1

Sample No.	Measurement of Pin Diameter in mm (X)				
1	5.99	5.97	6.01	6.01	6.00
2	5.98	6.00	5.98	6.00	5.99
3	6.00	5.98	5.99	5.98	6.01
4	5.97	5.99	6.02	5.99	6.01
5	6.03	6.00	5.98	6.01	6.00
6	6.02	5.99	5.99	6.00	5.98
7	6.00	6.01	6.02	6.02	6.03
8	5.98	5.97	6.00	6.01	6.02
9	6.01	6.00	5.99	6.00	6.01
10	6.02	5.99	5.98	6.02	6.00

    [mm graph paper required]   [(CO2) (Evaluate/HOCQ)]

                                                                              12

5. (a)   What is the purpose served by drawing fish-bone diagram?

    (b)   Write briefly on Pareto principle.

    (c)   State the purpose of X chart. How the chart can be constructed?
                                                [(CO2) (Remember/LOCQ)]
                                                4 + 4 + 4 = 12

Group - D

6. Sarita Electronics uses a single sampling plan of (256,4) for the purchase of connectors. Using the Poisson formula of approximation, calculate the AOQL for Sarita.
                                                (CO3) (Evaluate/HOCQ)]
                                                12

7. (a)   What is the role of a Coordinator in a Quality Circle? [(CO4) (Remember/LOCQ)]

    (b)   A Q.C. was formed in a Research Lab. 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.
                                                [(CO4) (Evaluate/HOCQ)]
                                                3 + 9 = 12

Group - E

8. (a)   Discuss the targets and objectives of ISO 14000 certification.
                                                [(CO4) (Remember/LOCQ)]

    (b)   Analyze the difference between ISO 14000 and ISO 9000.
                                                [(CO4) (Analyze/IOCQ)]
                                                (4 + 4) + 4 = 12

9. Evaluate, using a case study, the efficacy of Gemba Kaizen. [(CO4) (Analyze/IOCQ)]
                                                12

Cognition Level	LOCQ	IOCQ	HOCQ
Percentage distribution	33.3	19.9	46.8

Course Outcome (CO):
After the completion of the course students will be able to
1. Identify and control the quality of processes and hence that of products or goods & services by applying basic statistical tools.
2. Draw various types of Control Charts and analyze to ascertain the state of the process.
3. Develop different sampling plans to evaluate the quality of various types of defects.

4. Apply the techniques of Quality Circles and Kaizen in order to enhance work culture and Total Quality status in an organization.

*LOCQ: Lower Order Cognitive Question; IOCQ: Intermediate Order Cognitive Question; HOCQ: Higher Order Cognitive Question

Department & Section	Submission Link
AEIE/BT/CE /ECE/EE	https://classroom.google.com/c/NDA1NTczMTA2NjY1/a/NDY0MTk0ODcyMjcz/details