

16214(D) - 0 DEC 2016

B. Tech 7th Semester Examination

Total Quality Control (NS)

ME-411(e)/AU-411(e)

Time : 3 Hours

Max. Marks : 100

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.

Note : Attempt five questions in all, selecting one question from each sections A, B, C and D. Section E is compulsory. Assume missing data suitably, if any. Use of non programmable calculator is allowed.

SECTION - A

1. (a) Define total Quality control. What are the objectives of total quality control? (10)
- (b) What is the difference between SQC and SPC? State the benefits of statistical quality control in industry. (10)
2. (a) Explain the laws of probability for SQC. (10)
- (b) A controlled manufacturing process is 0.3% defective. What is the probability of taking more defective from a lot of 100 pieces by using Poisson distribution? (10)

SECTION - B

3. (a) What are control charts? Explain the control charts for variables. (10)
- (b) Draw C-chart for the following data pertaining to the number of foreign threads (considered as defects) in 15 piece of cloth 2×2 m of a certain piece.
7,12,3,20,21,5,4,3,10,8,0,9,6,7,20 (10)

4. (a) Draw a p control chart for the following data, state your conclusion. (10)

Sample (each of 100 units)	1	2	3	4	5	6	7	8	9	10
No. of defectives	12	10	8	8	9	9	7	10	11	8

- (b) Sketch neat and clean an OC curve for control charts. (10)

SECTION - C

5. (a) Give the relation between specification limits and control charts limits. (10)
- (b) What is cause and effect diagram? Explain with a suitable example. (10)
6. (a) Define process capability. What is its significance? (10)
- (b) What is the importance of process capability index and process performance index? (10)

SECTION - D

7. (a) Contrast the differences in concept and statistical techniques for sampling by attributes and by variables. (10)
- (b) What are the advantages of control chart for Attributes? Explain the following attribute Charts (i) P Chart (ii) Pn Chart. (10)

8. (a) Hardness test results on 500 pieces is given below

BHN	No. of pieces
290-294	17
295-299	86
300-304	240
305-309	104
310-314	43
315-319	10

Calculate the mean AND standard deviation of BHN.

(10)

- (b) Explain the difference between a C-chart and a U-chart.

(10)

SECTION - E

9. Answer all questions.

- (i) Define quality.
- (ii) Give the benefits of quality assurance.
- (iii) What is process capability index?
- (iv) Give the difference of control charts for variables with the charts for attributes.
- (v) Give the relation between the specification limit and control limit.
- (vi) What are the advantages of cumulative charts?

- (vii) Write a short note on control charts for attributes.
- (viii) What are the industrial applications of quality control techniques?
- (ix) Discuss the appropriateness of 3σ limits for control charts.
- (x) How can you improve the quality of a product?

(10×2=20)