[Total No. of Questions - 9] [Total No. of Pr ed Pages - 4]
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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 cummulative 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)