

Roll No.

23060

**M. Tech. 2nd Semester (M.E.)
(Manufacturing & Automation)
(Elective-I) Examination – May, 2016**

QUALITY CONTROL TECHNIQUES

Paper : 925/M-608-A(D)

Time : Three Hours] [Maximum Marks : 100

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt any *five* questions. All questions carry equal marks.

1. What do you mean by quality ? Explain the various factors affecting quality of a product. Discuss. 20

2. (a) Explain the term quality and quality control. How does quality control differ from conventional inspection? 10

- (b) Explain the difference between quality control and quality improvement. 10

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7. (a) Discuss Poisson and Normal distribution with practical examples. 10
 (b) Discuss acceptance samples and advantages of acceptance sampling over 100% inspection. 10
8. Write short note on the following : 20
 (a) Probability theory
 (b) Average Outgoing quality
 (c) Cumulative sum control chart

3. (a) Discuss the Type I and Type II Errors. 10
 (b) Discuss the Initiation of control charts detail. 10
4. Explain the Relationship of a process in Control to upper and lower specification limits and The Process capability study. 20
5. Determine the control limit for X and R chart if $\bar{X} = 357.50$, $ER = 9.90$, number of subgroups = 20. It is given that $A_2 = 0.18$, $D_3 = 0.41$ and $D_4 = 1.59$. The following are the X-bar and R values of subgroups of readings: X-bar = 10.2, 12.1, 10.8 and 10.9, R = 1.1, 1.3, 0.9 and 0.8. The specification limits for the components are 10.7 ± 0.2 . Establish the control limits for X-bar and R-charts. Will the product be able to meet its specification? Given (a) A_2 (factor for X-bar chart) = 0.58 (b) D_4 (factor for R chart) = 2.11 (c) D_3 (factor for R chart) = 0.00. 20
6. Discuss the concept of Cumulative sum control chart, Average run length and Relative efficiency or sensitivity of control chart. 20