Total No. of Questions :8] *[Total No. of Printed Pages :2*

Roll No .....

MMPD/MMIE-202

M.E./M.Tech. II Semester

Examination, June 2016

Reliability Engineering and Quality Management

Time : Three Hours

Maximum Marks: 70

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

1. In a fatigue test, the Weibull parameters are obtained as the shape parameter $\beta = 1.5$, Scale parameter $\alpha = 5{,}600$ cycles and location parameter $\gamma = 0$. Determine the reliability at the end of 9000 cycles of operation. What is the MTTF? 14

2. A random sample of 25 light-emitting diodes (LED's) is subjected to a life test. The test is terminated after 5 failures. Failed items are not replaced. The failure times in hours are 247, 270, 280, 305 and 360. Estimate the MTTR for the LED's assuming exponential distribution and find a 90% confidence interval for the mean life. 14

3. a) Point out the difference between quality control and inspection? 7

   b) Explain the concept of robust design? What is Taguchi loss function? 7

4. a) What is difference between quality control and statistical process control. 7

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   b) Explain attributes. What are control charts for attributes? 7

5. a) Describe the upper and lower limits for $\overline{R}$ chart. 7

   b) Explain the process average for P chart? 7

6. a) Explain the difference between producer's risk and consumer's risk. 7

   b) Briefly describe the single sampling, double sampling and multiple sampling. 7

7. a) Explain the inter-relationship among During 14 points? 7

   b) What are Crosby's basic elements of improvements? 7

8. a) What are major sources of waste? 7

   b) What are the characteristics of TQM? 7

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