

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**BE - SEMESTER-VII • EXAMINATION – WINTER 2013**

**Subject Code: 171906****Date: 03-12-2013****Subject Name: Quality and Reliability Engineering****Time: 10:30 TO 01:00****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1** (a) List out 7QC tools of problem solving. Explain any three. **07**  
 (b) Short note **07**  
     i) Fault Tree Analysis  
     ii) Total Employee Involvement
- Q.2** (a) i) What is reliability engineering? **03**  
     ii) Define Maintainability, Availability, Failure Rate and Mean Time To Repair **04**  
 (b) i) Which techniques are used to determine reliability **03**  
     ii) 6 transformers are tested for 600 hr, 2 failed after 50 and 200 hr and the remaining 4 transformer perform satisfactorily until the end of the test find the failure rate. **04**
- OR**
- (b) i) Define MTTF, MTBF and Failure density **03**  
     ii) Failure rate = 0.002 unit/hr. What is reliability for 900 hours? **04**
- Q.3** (a) Short note **07**  
     i) TAGUCHI's 8 point approach  
     ii) Advantages of JIT production system  
 (b) Explain implantation barriers and scope of ISO9000. **07**
- OR**
- Q.3** (a) Explain basic concepts, scope and implantation barriers of ISO 14000. **07**  
 (b) Short note **07**  
     i) Principles of Robust Design  
     ii) KANBAN System
- Q.4** (a) What is Concurrent Engineering? Explain need of Concurrent Engineering. **07**  
 (b) Short note **07**  
     i) Agile Manufacturing  
     ii) Business Process Re-engineering
- OR**
- Q.4** (a) What is Six Sigma? Discuss merits and demerits of six sigma. **07**  
 (b) Short note **07**  
     i) Lean Manufacturing  
     ii) World class manufacturing
- Q.5** (a) What is TPM? Discuss Role of Total Production Maintenance. **07**  
 (b) Explain fundamental laws of probability **07**
- OR**
- Q.5** (a) "Quality as winning strategy"; Justify the sentence **07**  
 (b) Define: Inspection, Quality Control, Quality assurance, Quality management, Probability, Random variables, Total productive maintenance **07**

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