

Roll No

MEDI/MTDE - 302(C)

M.E./M.Tech. III Semester

Examination, December 2016

Safety and Reliability

Time : Three Hours

Maximum Marks : 70

- Note:* i) Attempt any five questions.
ii) All questions carry equal marks.

1. a) What do you understand by safety engineering? What are the different modes of safe operation explain any one of them in details?
b) Give the classification of failures and discuss the safety measures for that.
2. a) What is Reliability testing? Enumerate the types of used to evaluate a design.
b) How you will improve the reliability of a system? Explain with the curve showing reliability against normalized time for two elements in parallel with constant failure rate.
3. a) What is Quality? Explain the quality control design procedure.
b) What are the quality control techniques? Discuss some of these with suitable examples.
4. a) What do you mean by reliability design? Explain with live example.
b) What is reliability testing? Enumerate the types of test used to evaluate a design.

5. a) What do you mean by Redundancy? Why is it so important in the satisfactory working of a system?
b) Three identical components, each with a reliability of 0.9 for 1000 hours, are operating in parallel. What is the system reliability for 1000 hours if only one of the units is required for success of the system?
6. a) State whether a uniform distribution represents an increasing failure rate, decreasing failure rate, or constant failure rate.
b) What do you understand by Markov modeling? Explain any area of application of Markovian process taking suitable examples.
7. A system consists of four identical components in series configuration. The components are having failure rate, on an average, 0.005 per hour. Using event tree diagram, find out the reliability of the entire system, up to failure of two components, assuming a total mission time of 150 hours.
8. Write short notes on following (Any three) :
 - a) Safety Codes and standards
 - b) Risk factor
 - c) OC curve
 - d) Hazard rate and Failure rate
