

19AA1302

M. Tech. EXAMINATION, 2021

(First Semester)

(C Scheme) (Main & Re-appear)

(ME)

MEM503C

RELIABILITY AND MAINTENANCE ENGINEERING

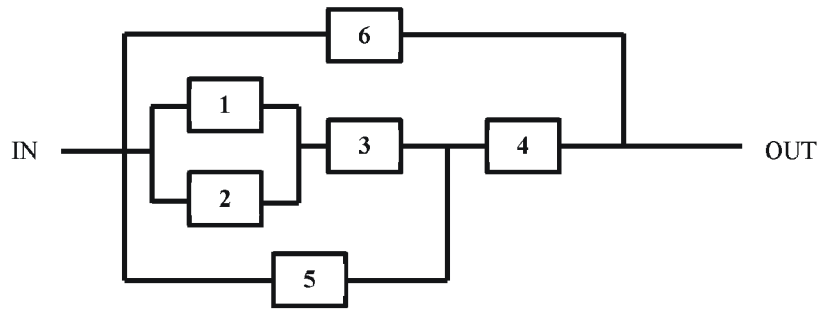
Time : 2½ Hours]

[Maximum Marks : 75

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

Note : Attempt *Four* questions in all. All questions carry equal marks. Use of Statistical Tables (e.g. Area under Normal Curve, *t*-distribution, F-distribution, Chi-Square, Correlations etc. are permitted.). Assume missing data, if any, suitably.

1. Define the terms MTBF, MTTR and MTTF. Explain the physical significance of each term with examples.
2. A system consists of four components. If more than two of the components fail, the system fails. If the components have an exponential time-to-fail distribution with a failure rate of 0.000388, what is the reliability of the system at time = 300 ? What is the system mean time to fail ?
3. Find the reliability of the system assuming that each component is statistically independent. The reliability of the components *i.e.*, 1, 2, 3, 4, 5 and 6 is 0.85, 0.90, 0.95, 0.90, 0.80 and 0.85 respectively.



4. A system consists of three components in series, each with a reliability of 0.96. A second set of three components is purchased and a redundant system is built. What is the reliability of the redundant system (a) with high-level redundancy, (b) with low-level redundancy ?
5. Explain in brief various types of maintenance organizations. Discuss the functions, duties and responsibilities of maintenance engineering department.
6. What do you mean by preventive maintenance. Explain the conditions when preventive maintenance is used citing suitable examples. What Are Benefits and Drawbacks of Preventive Maintenance ?
7. What is Total Productive Maintenance (TPM)? Explain the different pillars of TPM and their importance.
8. Explain in detail Computerized Maintenance management System with suitable examples.