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Total No. of Questions :5] *[Total No. of Printed Pages :2*

Roll No .....

AU/ME - 801(C)

B.E. VIII Semester

Examination, December 2016

Reliability and Maintenance

(Elective - III)

Time : Three Hours

Maximum Marks : 70

Note: i) Answer five questions. In each question part A, B, C is compulsory and D part has internal choice.

ii) All parts of each question are to be attempted at one place.

iii) All questions carry equal marks, out of which part A and B (Max.50 words) carry 2 marks, part C (Max.100 words) carry 3 marks, part D (Max.400 words) carry 7 marks.

iv) Except numericals, Derivation, Design and Drawing etc.

1. a) Define Mean Time Between Failure (MTBF).
   b) Define Mean Time To Failure (MTTF).
   c) What is Failure rate and how it is used in the calculation of Reliability?
   d) Draw and explain mortality curve.

   OR

   Explain Weibull distribution. How reliability of system can be computed with this distribution.

2. a) Define Availability of a mechanical system.
   b) Compare reliability and quality.
   c) Derive equation for calculation of reliability of a parallel system.
   d) Explain Tie and Cut set method of reliability calculation.

   OR

A critical measuring instrument consists of two sub-systems connected in series. Sub-systems A and B have reliabilities 0.9 and 0.92 respectively, for a certain operating time. It is necessary that the reliability of the instrument be raised to a minimum value of 0.917 by using parallel sub systems of A alone. Determine how many units of A should be used with one B to get minimum reliabilities value of 0.98. What is the actual reliability value obtained.

3. a) Write objectives of a maintenance activity in an industry.
   b) Define corrective maintenance strategy.
   c) Define productive maintenance. In which industry this type of maintenance can be used.
   d) Compare shutdown and scheduled maintenance with examples.

   OR

   Explain steps to be taken in adoption of preventive maintenance.

4. a) Write principle of working of CBM.
   b) What are main pillers of condition monitoring?
   c) What are steps involved in visual monitoring?
   d) How performance monitoring can be ascertained in a mechanical system?

   OR

   What are various methods of wear debris analysis in a mechanical system?

5. a) Define Reliability Centered Maintenance (RCM).
   b) Write benefits of Total Productive Maintenance (TPM).
   c) Write advantages of using Failure Modes and Effects Analysis (FMEA).
   d) Explain in detail about Failure Modes, Effects and Criticality Analysis (FMECA).

   OR

   Explain steps involved in carrying out design under FMEA.

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