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

Roll No .....

MMCM - 205

M.E./M.Tech. II Semester

Examination, December 2015

Reliability and Total Productive Maintenance

Time : Three Hours

Maximum Marks : 70

Note: i) Attempt any five questions.
ii) Each part (a) and (b) carry equal marks.

1. a) Explain MTBF and MTTF.
   b) The reliability of a cutting assembly is given by

$$R(t) = \begin{cases} (t - t/t_o)^2 & 0 \le t \le t_o \\ 0 & t \ge t_o \end{cases}$$

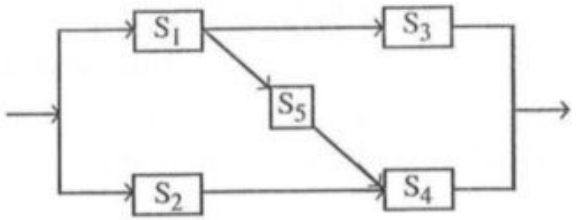
Determine:
i) Failure rate
ii) Does failure rate increase or decrease with time
ii) The MTTF

2. a) Explain Weibull distribution as applied to failure rate.
   b) If Two reliability functions have the same mean, show that their reliabilities may be different for the same operating time.

3. a) Explain constant Hazard model.\
   b) A linear hazard function $\lambda(t) = 5\times10^{-6}t$, where t is measured in operating hours. If the reliability of 0.98 is desired, What is the design life?

4. a) How will you calculate system reliability of subsystem connected in series?
   b) Calculate the reliability of two elements connected in parallel with their probability of functioning as 0.9 and 0.8.

5. Calculate the reliability of complex system as shown below:



6. a) Explain Duane curve.
   b) Explain FTA. How it is applied to improve the reliability of system.

7. a) Explain the concept of TPM and its importance in the industry.
   b) Discuss the different causes of machine failure. How will you calculate the down time?

8. Write short notes on any two of the following:
   a) Maintenance policies
   b) Risk assessment and its analysis
   c) FMECA

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