9. a) Give the concept of Total Productive Maintenance (TPM)? Explain the role of maintenance engineer in implementing TPM. RGPVONLINE.COM 7

b) What are the elements of Failure Mode and Effects Analysis (FMEA)? Give its advantages and limitations. 7

OR

10. a) What are the elements of Reliability Centered Maintenance (RCM)? Comment on the suitability of RCM in industries. 7

b) Write short notes on (any two) : 7

i) FMECA

ii) Pillars of TPM

iii) Criticality analysis

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Roll No .....

ME/AU - 801(C)

B.E. VIII Semester

Examination, June 2015

Reliability and Maintenance

(Elective - III)

Time : Three Hours

Maximum Marks : 70

Note: Attempt all questions. All questions carry equal marks. Assume data if needed.

1. a) Explain terms mean time to repair, mean time between failure and mean time to failure along with their relationship. 7

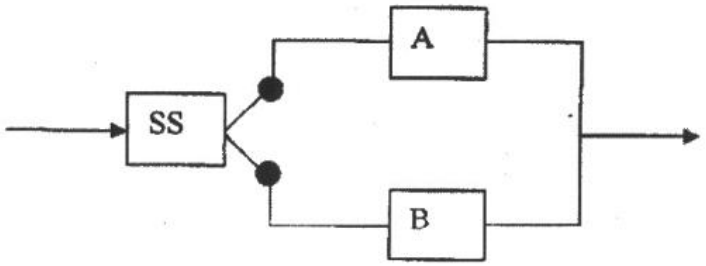
b) Differentiate between continuous and discreet probability distribution and show how binomial distribution can be approximated to normal distribution. 7

OR

a) Time to failure of an electric device is considered to follow a Weibull distribution. Ten of these devices are put to life testing. The times to failure (in hours) are 89, 132, 202, 263, 321, 362, 421, 473, 575 and 663. If the Weibull distribution is correct choice to model the data, what are the parameters of this probability density function? What is the reliability of a typical device at 1000 hours? 7

b) Differentiate between failure rate and hazard rate and establish relationship between them. Also express reliability as a function of hazard rate. 7

3. Find out the reliability of a system which has standby redundancy by incorporating a sensing and switching device SS as shown in figure



The system can work well when component A is functioning but when it fails sensing switch allows component B to take over. Derive the expression for system reliability at any time *t*. 14

OR

4. a) A system is comprised of four serially related components each having Weibull time to failure distribution with parameters as follows :

Components	Scale parameter	Shape parameter
1	100	1.20
2	150	0.87
3	510	1.80
4	720	1.00

Calculate the system reliability for time t = 50 hours. 7

b) Define the term Overall Equipment Effectiveness (OEE) and establish relationship between quality, reliability, maintainability and availability. 7

5. a) Explain the major functions of maintenance department in an organization along with its objectives. 7

b) What is design out maintenance? Is it possible to achieve the objectives of design out maintenance in all operating system? 7

OR

6. a) Differentiate between preventive and corrective maintenance. How will you decide the level of preventive maintenance that may be needed keeping overall cost of maintenance in mind? 7

b) What are the types of maintenance schedule that are prevalent in industries and explain the benefits of proper scheduling? 7

7. a) What are the principles of condition based maintenance? Enlist the factors that promote the use of condition based maintenance. 7

b) Discuss the corrosion monitoring procedure and possible outcomes of such analysis as an aid to identify the need of the maintenance. 7

OR

8. a) Describe the procedure of implementing condition based maintenance system and enlist its benefits. 7

b) Explain the constructional details and working principle of devices used for vibration and noise monitoring of a machine. 7