B.Tech. MECHANICAL ENGINEERING (COMPUTER INTEGRATED MANUFACTURING)
Term-End Examination

00571   December, 2019

BME-025 : CONDITION MONITORING AND MAINTENANCE ENGINEERING

Time : 3 hours   *Maximum Marks : 70*

*Note : Attempt any **seven** questions. All questions carry equal marks. Use of scientific calculator is allowed. All the terms carry their usual meaning.*

1. (a)   Explain the functions and objectives of maintenance.

    (b)   Distinguish between Productive maintenance and Predictive maintenance.   *5+5*

2. (a)   What are the situations demanding adoption of contractual maintenance ? Discuss its advantages and disadvantages.

    (b)   A complex mechanical system consisting of electronic gadgets has MTBF of 120 hours and MTTR of 180 minutes. Find the availability of the system.   *5+5*

3. (a) Explain the importance of scheduling in Plant Engineering and Management.

(b) A group of six jobs is to be processed through a two-step operation. The first operation involves cleaning and the second involves painting. Determine a sequence that will minimize the total completion time for this group of jobs. Processing times are as follows :   *5+5*

Job	Processing Time (hours)	
	Work Centre 1	Work Centre 2
A	5	5
B	4	3
C	8	9
D	2	7
E	6	8
F	12	15

4. (a) Define standardisation. What is its significance in maintenance of spare parts management ?

(b) Distinguish between TPM and TQM.   *5+5*

5. (a) Explain the procedural steps in setting up a condition-based maintenance activity. What consequences do you expect with implementation of CBM ?

(b) With the help of suitable example, explain "No Trend".   *5+5*

6. (a) Discuss the four steps — Detection, Diagnosis, Prognosis and Programme used in condition monitoring.

(b) Describe the stages of machine life cycle with the help of Bathtub curve.   *5+5*

7. (a) Discuss the role and focus of Kaizen on TPM.

(b) What do you understand by FMECA ? What are the steps in basic analysis procedure of FMECA ?   *5+5*

8. (a) Explain why a product or a system might have an overall reliability that is low, even though it is comprised of components that have fairly high reliabilities.

(b) Consider a system as shown in figure 1. The reliability of each of the elements is given in the figure. Find the overall reliability of the total system.   *5+5*
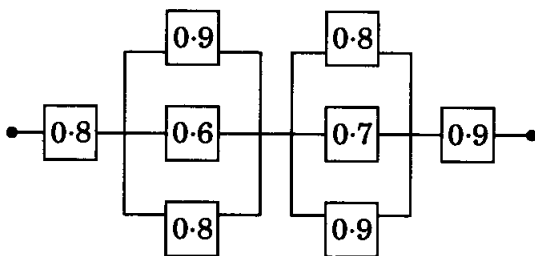
Figure 1

9. (a) Discuss the costs associated with equipment breakdown.

(b) The failure rate of a mechanical watch is 0·0005 failures per hour. Calculate the Mean Time to Failure (MTTF). *5+5*

10. (a) Differentiate between breakdown and emergency maintenance.

(b) Describe in brief on the following NDT techniques : *5+5*

(i) Liquid penetration

(ii) Radiography

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