BME-025

B.Tech. MECHANICAL ENGINEERING (COMPUTER INTEGRATED MANUFACTURING)

Term-End Examination

December, 2015

BME-025 : CONDITION MONITORING AND MAINTENANCE ENGINEERING
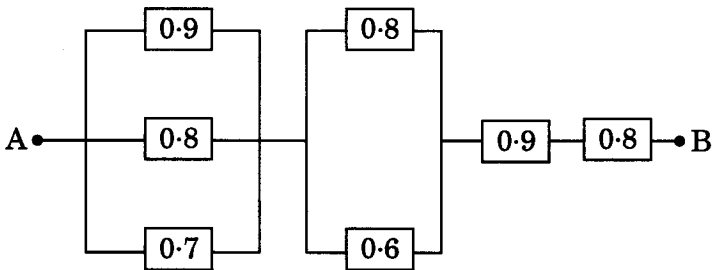
Time : 3 hours   *Maximum Marks : 70*

Note : *Answer any* **ten** *questions. All questions carry equal marks. Use of scientific calculator is allowed.*

1. (a) What is maintenance management ? Explain the objectives of plant engineering and management.

   (b) List out the factors influencing the maintenance policies. How do you formulate a maintenance strategy ? Explain.   *4+3*

2. (a) Distinguish between the centralised and decentralised systems of plant engineering.

   (b) Discuss the importance of co-ordination function with reference to the plant engineering and management.   *4+3*

3. What is Codification ? What is its significance in maintenance spare parts management ? What are the advantages of codification ?   7

4. What do you understand by Total Productive Maintenance ? Differentiate between Total Productive Maintenance (TPM) and Total Quality Management (TQM).   7

5. A complex electronics system consisting of electronic gadgets has MTBF 120 hours and MTTR of 150 minutes. Compute the availability.   7

6. The reliability of a system is estimated at 0·7. On application of condition monitoring techniques the reliability of the system is found to be improved to 0·8. Find the Reliability Improvement Factor (RIF) and also give your comments on its probability of failures.   7

7. Calculate the reliability of the following systems in which the probability of functioning of each component is given in the Figure 1 itself :   7

Figure 1

8. Explain the meaning and significance of the two parameters of the Weibull distribution. Discuss the characteristics of shape parameter. 7

9. A machine has been purchased at a cost of ₹ 1,60,000. The value of the machine is depreciated in the first three years by ₹ 20,000 each year and ₹ 16,000 per year thereafter. Its maintenance and operating costs for the first three years are ₹ 16,000, ₹ 18,000 and ₹ 20,000 in that order and increased by ₹ 4,000 every year. Assuming an interest rate of 10%, find the economic life of the machine. 7

10. Consider seven jobs that are processed on two operations, X and Y. The job is processed in sequence so that Y should follow X. Determine the optimal order in which the jobs should be sequenced. 7

Job	1	2	3	4	5	6	7
Processing Time on X (in hrs)	4	2	1	6	7	8	9
Processing Time on Y (in hrs)	7	6	2	3	7	5	6

11. Define and explain the concept of Kaizen. Discuss the application of Kaizen on process, operation, layout and equipment.   7

12. Explain the concept of Just In Time (JIT). What are the advantages of JIT system ? Explain the difficulties in JIT implementation.   7

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