

B.E. / B.Tech. - DEGREE EXAMINATIONS, NOV / DEC 2025

Seventh Semester

Mechanical Engineering

20PROE908 - MAINTENANCE ENGINEERING

Regulations - 2020

Duration: 3 Hours

Max. Marks: 100

PART - A (MCQ) (10 × 1 = 10 Marks)

Answer ALL Questions

	<i>Marks</i>	<i>K- Level</i>	<i>CO</i>
1. Maintenance Objectives are (a) Maximizing Production and Minimizing energy use (b) Optimizing Resource Utilization (c) Reduced down time (d) All of the above	1	K1	CO1
2. The fraction of time a piece of equipment is expected to be available for operation (a) Availability (b) MTBF (c) MTTR (d) All of the above	1	K1	CO1
3. Preventive maintenance is used to ensure that breakdowns (a) are eliminated (b) are reduced (c) are less costly (d) cannot happen	1	K1	CO2
4. Companies usually find that minimizing the total cost of maintenance requires them to: (a) shift completely over to preventive maintenance. (b) abandon breakdown maintenance as a policy. (c) find some balance between preventive and breakdown maintenance. (d) Outsource breakdown maintenance but in-source preventive maintenance.	1	K1	CO2
5. Which condition monitoring method is used to evaluate the alignment and balance of rotating machinery? (a) Partial discharge testing. (b) Oil analysis (c) Thermography (d) Vibration Analysis	1	K1	CO3
6. Which technique is commonly used to assess the condition of gears in machinery? (a) Oil analysis (b) Acoustic analysis (c) Vibration analysis (d) Ultrasonic Testing	1	K1	CO3
7. Which part of the lathe has a long shaft with the keyway extending from the feed box across and in front of the bed? (a) Feed rod (b) Headstock Spindle (c) Sliding gear shaft (d) Leadscrew	1	K1	CO4
8. Which of the following is NOT a lathe turning operation? (a) Threading (b) Sawing (c) Facing (d) Grooving	1	K1	CO4
9. In machine repair, spindles that have experienced minor wear are often repaired by (a) Completely replacing the spindle with a new one (b) Welding additional material and re-machining to original specifications (c) Coating with paint to prevent further wear (d) Ignoring the wear if it is minor	1	K1	CO5
10. Which of the following is a common repair method for worn-out conveyor belts in material handling equipment? (a) Replacing the entire conveyor system (b) Applying lubricant to the belt surface (c) Splicing or patching damaged sections of the belt (d) Painting the conveyor belt	1	K1	CO5

PART - B (12 × 2 = 24 Marks)

Answer ALL Questions

11. State the benefits of reliability analysis in industries.	2	K1	CO1
12. Define machine availability.	2	K1	CO1

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| 13. Define environmental impact. | 2 | K1 | CO2 |
| 14. Define repair cycle. | 2 | K1 | CO2 |
| 15. What are the causes of vibration? | 2 | K1 | CO3 |
| 16. List down the key features of condition monitoring. | 2 | K1 | CO3 |
| 17. Discuss about Age- Dependent Failures. | 2 | K1 | CO4 |
| 18. What is of Fault Tree Diagram? | 2 | K1 | CO4 |
| 19. List the benefits of proper maintenance of material handling equipments. | 2 | K1 | CO5 |
| 20. List CMM software. | 2 | K1 | CO5 |
| 21. What is the difference between Jig & fixture? | 2 | K1 | CO5 |
| 22. Discuss prescriptive breakdown. | 2 | K1 | CO2 |

PART - C (6 × 11 = 66 Marks)

Answer ALL Questions

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| 23. a) Explain the various objectives and principles of maintenance planning. | 11 | K2 | CO1 |
| OR | | | |
| b) (i) Discuss the different types of organization. | 6 | K2 | CO1 |
| (ii) Write short notes on MTBF. | 5 | K2 | CO1 |
| 24. a) What are all the steps involved in preventive maintenance why preventive maintenance is better than reactive maintenance. | 11 | K2 | CO2 |
| OR | | | |
| b) Explain the different methods of lubrication in detail. | 11 | K2 | CO2 |
| 25. a) Explain the principle and working of pistol thermometer. | 11 | K2 | CO3 |
| OR | | | |
| b) Explain how cost comparison is done in condition monitoring. | 11 | K2 | CO3 |
| 26. a) Explain the repair methods of bearing. | 11 | K2 | CO4 |
| OR | | | |
| b) Explain the various types of failure mechanisms. | 11 | K2 | CO4 |
| 27. a) Explain the detail repair methods for material handling equipment. | 11 | K2 | CO5 |
| OR | | | |
| b) Explain the general structure of computerized maintenance management system. | 11 | K2 | CO5 |
| 28. a) (i) Explain about the fault tree method. | 6 | K2 | CO4 |
| (ii) Elaborate the general structure of six phases of good maintenance management. | 5 | K2 | CO5 |
| OR | | | |
| b) (i) Briefly explain the repair methods of machine beds. | 6 | K2 | CO4 |
| (ii) Write short notes on the maintenance requirements for belt conveyors. | 5 | K2 | CO5 |