

8. Corrective maintenance is performed when:
- Equipment operates below design specifications but has failed
 - Equipment operates normally without intervention
 - Equipment has failed completely
 - Equipment requires only minor adjustments
9. What stage of the bathtub curve is characterized by a decreasing failure rate?
- Infant mortality
 - Normal operation
 - Wear-out phase
 - Reliability growth
10. What is a critical advantage of opportunistic maintenance?
- Reduces operational cost significantly
 - Improves equipment availability immediately
 - Optimizes downtime for multiple repairs
 - Requires minimal planning and resources
11. What is the name of the device attached to the steam chest to prevent explosions caused by excessive internal steam pressure?
- Safety valve
 - Water level indicator
 - Pressure gauge
 - Fusible plug
12. The amount of water evaporated in kg per kg of fuel burnt is called:
- Evaporative capacity of boiler
 - Equivalent evaporation from and at 100 °C
 - Boiler Efficiency
 - Specific heat capacity
13. A fusible plug is primarily used for safety purposes in which of the following types of boilers?
- High-pressure boilers
 - Marine-type boilers
 - Fire-tube boilers
 - Oil-fired boilers
14. How does a CMMS handle opportunistic maintenance?
- By scheduling all tasks simultaneously without prioritization
 - By grouping maintenance tasks based on downtime opportunities for multiple assets
 - By predicting asset failures in real-time
 - By prioritizing critical assets over non-critical ones
15. What safety protocol is critical when working on maintenance tasks in high-noise environments?
- Ensuring workers communicate exclusively via hand signals
 - Issuing noise-canceling headphones to all employees
 - Conducting regular noise level assessments and providing ear protection
 - Scheduling maintenance tasks during low-activity hours
16. Why is it necessary to conduct a pre-maintenance inspection for personal protective equipment?
- To meet compliance standards for inventory management
 - To ensure that the equipment is in good condition and offers adequate protection
 - To align use with maintenance schedules
 - To reduce the time required for task execution

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17. What should be the first step in a Lockout/Tagout process?
 Attach a tag to the energy-isolating device
 Notify affected employees about the maintenance task
 Shut down the equipment or machine
 Apply the lock to the energy-isolating device
18. What is the consequence of operating a pump with insufficient suction head?
 Reduced pump efficiency
 Overheating of pump seals
 Cavitation damage
 All of the above
19. Which maintenance practice ensures minimal downtime for mechanical drive systems?
 Predictive maintenance
 Corrective maintenance
 Preventive maintenance
 Run-to-failure maintenance
20. Select the incorrect statement from the following option.
 Lubricant keep out dirt
 Lubricant transmit fluid power
 Lubricant act as a seal
 Lubricant enhance corrosion

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SECTION "B"

Attempt ALL the questions.

1. Define maintenance with an example. What factors need to be considered before making maintenance decisions? [2+2]
2. What is the difference between reactive maintenance and proactive maintenance? [2]
3. What are the key steps involved in performing corrective maintenance activities? Explain with an example. [4]
4. Explain the importance of the bathtub curve in maintenance engineering. Support your explanation with an appropriate figure. [4]
5. List the procedures that should be followed to reduce maintenance costs in manufacturing industries. [3]
6. Define CMMS. What are the six key factors that contribute to the poor implementation success of a CMMS. [1+3]
7. Explain the process of liquid penetrant testing in non-destructive test with the help of a figure. What are the different types of penetrants used, and what are their properties? [4+1+2]
8. Explain why longitudinal and shear waves are important during inspections conducted using Ultrasonic test? [2]
9. What is a permit to work? What are the essential elements that must be included in permit-to-work scheme? [1+3]
10. Define Safe System of Work. Outline the framework for developing and maintaining a Safe System of Work. [1+2]
11. List the key fire protection strategies that should be implemented in a workplace. [3]
12. In a brewery, pumps and chain drives are critical mechanical components of the production process. The plant manager seeks to minimize operational downtime and enhance system reliability by developing an effective maintenance strategy. As the newly appointed "Maintenance Engineer," propose a detailed maintenance strategy for the pumps and chain drives in the brewery. Your strategy should ensure safety compliance for operators and customers, and improve the overall efficiency of these systems. Discuss the expected outcomes of implementing your maintenance strategy. [15]

