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Question Paper Code	12605
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**B.E. / B.Tech. - DEGREE EXAMINATIONS, APRIL / MAY 2024**

Seventh Semester

**Mechanical Engineering**

**20PROE908 - MAINTENANCE ENGINEERING**

Regulations - 2020

Duration: 3 Hours

Max. Marks: 100

**PART - A (10 × 2 = 20 Marks)**

Answer ALL Questions

	Marks	K-Level	CO
1. State the aims of maintenance activity in an engineering organization.	2	K1	CO1
2. Define machine availability.	2	K1	CO1
3. What are the types of maintenance?	2	K1	CO2
4. List the purpose of lubrication.	2	K1	CO2
5. State the purpose of temperature monitoring.	2	K1	CO3
6. Define wear.	2	K1	CO3
7. What are beds?	2	K1	CO4
8. Write the application of lead screws.	2	K1	CO4
9. Name any four material handling equipments.	2	K1	CO5
10. What is work permit?	2	K1	CO5

**PART - B (5 × 13 = 65 Marks)**

Answer ALL Questions

11. a) What do you understand by maintenance categories? Explain common types and explain the basis of their selection.	13	K2	CO1
<b>OR</b>			
b) Explain MTBF, MTTF, MTTR and failure rate.	13	K2	CO1
12. a) What are the basic elements of reliability and explain the factors to be considered in designing for reliability.	13	K2	CO2
<b>OR</b>			
b) How will you implement TPM in automotive industry? Explain.	13	K2	CO2
13. a) Discuss the process involved in condition monitoring.	13	K2	CO3
<b>OR</b>			
b) What is wear debris analysis? Explain the three wear debris analysis techniques commonly used and compare their performance and uses.	13	K2	CO3

14. a) Explain fault tree analysis with suitable examples. 13 K2 CO4  
**OR**  
b) List the repair methods of gears. 13 K2 CO4
15. a) Narrate repair methods of Material Handling Equipment (MHE). 13 K2 CO5  
**OR**  
b) Explain the repair methods of Slide ways, Spindle, Lead screws and bearing in a CNC Machine. 13 K2 CO5
- PART - C (1 × 15 = 15 Marks)**
16. a) Briefly explain the usage of computers in maintenance procedure. 15 K2 CO5  
**OR**  
b) Explain the maintenance procedure for hydraulic lift and conveyer. 15 K2 CO1