Reg. No.															

Question Paper Code	13424

B.E. / B.Tech. - DEGREE EXAMINATIONS, APRIL / MAY 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

		Marks	K – Level	CO
1.	Which of the following is a primary objective of maintenance planning? (a) Increase material cost (b) Increase breakdowns (c) Reduce machine availability (d) Maximize equipment uptime	1	K1	CO1
2.	Choose the correct formula for Availability. (a) MTBF / (MTTR + MTBF) (b) MTTR × MTBF (c) MTTR / MTBF (d) MTTR – MTBF	1	K1	CO1
3.	Classify maintenance categories. (a) Reactive, Predictive, Proactive (b) Preventive, Predictive, Corrective (c) Productive, Preventive, Active (d) None of the above	1	K1	CO2
4.	List the characteristics of a good maintenance policy. (a) Random checks (b) Periodic review and updates (c) No documentation (d) Unscheduled downtime	1	K1	CO2
5.	Define condition monitoring. (a) Monitoring operating parameters to detect faults (b) Replacing parts regularly (c) Delaying maintenance (d) Manual breakdown checks	1	K1	CO3
6.	Relate CM with cost savings. (a) Increases cost (b) Increases energy loss (c) Improves fuel cost (d) Reduces downtime and expenses	1	K1	CO3
7.	Name the failure that results in the loss of alignment. (a) Wear (b) Fatigue (c) Slideway damage (d) Rusting	1	K1	CO4
8.	Which method ensures sequential fault location? (a) Random checks (b) Logical sequencing (c) Mass replacement (d) Shutdown	1	K1	CO4
9.	Define a job order system. (a) Random job issuing (b) Vendor list (c) System to track work assignments (d) Emergency log	1	K1	CO5
10.	Choose the benefit of using computers in maintenance. (a) Manual errors (b) Delay in scheduling (c) Real-time tracking (d) More paperwork	1	K1	CO5

PART - B (12 × 2 = 24 Marks)

Answer ALL Questions

11.	Define maintenance.	2	K1	CO1
12.	Write down the types of maintenance organizations.	2	K1	CO1
13.	Outline the factors that affect machine availability.	2	K2	CO1
14.	Define the term Preventive Maintenance.	2	K1	CO2
15.	What is repair cycle in maintenance?	2	K1	CO2
16.	Write down the cost of maintenance with and without condition monitoring.	2	K1	CO2
17.	Define condition monitoring.	2	K1	CO3
18.	Identify the various temperature monitoring techniques.	2	K1	CO3
19.	Define failure mode and effect analysis.	2	K1	CO4

20.		What are the reasons for tooth breakage in gears?	*2*	*K1*	*CO4*
21.		List the types of material handling equipment.	*2*	*K1*	*CO5*
22.		List the repair techniques used for cranes and hoists.	*2*	*K1*	*CO5*

PART - C (6 × 11 = 66 Marks)

Answer ALL Questions

23.	a)	Explain the objectives and basic principles of planned maintenance.	*11*	*K2*	*CO1*
		OR			
	b)	Summarize the following: (i) MTBF (ii) MTTR (iii) MWT	*11*	*K2*	*CO1*
24.	a)	Classify the types of maintenance categories and explain them in detail.	*11*	*K2*	*CO2*
		OR			
	b)	Inference the principles and various methods of lubrication.	*11*	*K2*	*CO2*
25.	a)	Identify the various condition monitoring methods and explain on-load and off-load methods with simple sketches.	*11*	*K2*	*CO3*
		OR			
	b)	Classify the types of wear and explain wear debris analysis in detail.	*11*	*K2*	*CO3*
26.	a)	Identify the various repair methods of spindles, gears, bearings and lead screws.	*11*	*K2*	*CO4*
		OR			
	b)	Develop the procedural steps for sequence fault location with suitable examples.	*11*	*K2*	*CO4*
27.	a)	Categorize the various repair methods for belt conveyors with neat sketches.	*11*	*K2*	*CO5*
		OR			
	b)	Examine the uses of computers in maintenance and explain the general structure of a computerized maintenance management system.	*11*	*K2*	*CO5*
28.	a) (i)	Compare logical fault location methods and sequential fault location methods.	*6*	*K2*	*CO4*
	(ii)	Outline the importance of equipment records in tracking maintenance history and performance.	*5*	*K2*	*CO5*
		OR			
	b) (i)	Explain the step-by-step repair methods used for worn-out slideways and beds in machine tools.	*6*	*K2*	*CO4*
	(ii)	Compare manual and computerized job order systems used in maintenance planning.	*5*	*K2*	*CO5*