Reg. No.																

Question Paper Code	14319

B.E. / B.Tech. - DEGREE EXAMINATIONS, APRIL / MAY 2026

Eighth Semester

Mechanical Engineering

20MEEL 805 - INDUSTRIAL SAFETY AND MAINTENANCE ENGINEERING

Regulations - 2020

Duration: 3 Hours | Max. Marks: 100

PART - A (i) (MCQ)
(16 × 1 = 16 Marks)
Answer ALL Questions

		Marks	K – Level	CO
1.	Employee participation in safety helps to_____ a) increase workload b) reduce safety awareness c) improve safety culture d) delay production	1	K1	CO1
2.	In electroplating, the main safety risk arises from _____ a) mechanical vibration b) toxic chemical exposure c) high noise d) low temperature	1	K1	CO1
3.	Cold pipe bending may still require safety precautions because of _____ a) heat generation b) spring-back and stored elastic energy c) chemical reaction d) radiation	1	K2	CO1
4.	Industrial fire prevention mainly involves _____ a) painting walls b) installing fire protection systems c) hiring workers d) cleaning machines	1	K1	CO2
5.	Personal protective equipment is used to _____ a) improve machine performance b) protect workers from workplace hazards c) increase production rate d) reduce maintenance cost	1	K1	CO2
6.	HAZOP technique is applied for _____ a) equipment installation b) hazard identification and risk assessment c) production scheduling d) cost estimation	1	K2	CO2
7.	Industrial hygiene mainly deals with _____ a)production planning b) workplace health and environmental control c) financial management d) marketing strategies	1	K1	CO3
8.	Occupational diseases are generally caused by _____ a) sudden accidents b) machine failure c) long-term exposure to workplace hazards d) poor supervision	1	K1	CO3
9.	The Factories Act focuses on _____ a) product quality b) worker health, safety and welfare c) market expansion d) export regulations	1	K2	CO3
10.	MTBF refers to _____ a) Mean Time Between Failures b) Mean Time Before Failure c) Machine Total Breakdown Factor d) Maintenance Time Balance Factor	1	K1	CO4

11.	Lubrication in machines is used to _____		*1*	*K1*	*CO4*
	a) increase friction	b) reduce wear and tear			
	c) increase temperature	d) reduce efficiency			
12.	Breakdown maintenance is most suitable for _____		*1*	*K2*	*CO4*
	a) critical machines	b) non-critical and low-cost equipment			
	c) high precision systems	d) continuous production systems			
13.	Condition Monitoring (CM) is primarily used to _____.		*1*	*K1*	*CO5*
	a) increase machine cost	b) detect equipment condition during operation			
	c) eliminate maintenance	d) replace inspection			
14.	Temperature sensitive tapes are used to _____		*1*	*K1*	*CO5*
	a) measure pressure	b) measure speed			
	c) detect vibration	d) indicate temperature changes			
15.	Wear debris analysis helps to _____		*1*	*K2*	*CO6*
	a) increase lubrication	b) reduce temperature			
	c) identify internal machine wear condition	d) improve speed			
16.	Control methods in safety management are used to _____		*1*	*K2*	*CO6*
	a) increase hazards	b) increase downtime			
	c) reduce or eliminate risks	d) delay maintenance			

PART - A (ii) (Short Answer Questions)
(6 × 3 = 18 Marks)
Answer ALL Questions

17.	Explain the significance of employee participation in enhancing workplace safety culture.		*3*	*K2*	*CO1*
18.	Outline the importance of controlling toxic gases and chemicals in industrial environments.		*3*	*K2*	*CO2*
19.	Summarize the role of welfare facilities in improving employee health and efficiency.		*3*	*K2*	*CO3*
20.	Identify the maintenance strategies based on MTBF, MTTR, and availability factors to enhance system performance.		*3*	*K3*	*CO4*
21.	Classify the methods of on-load and off-load testing used in maintenance practices.		*3*	*K3*	*CO5*
22.	Plan effective maintenance management practices incorporating equipment records, job order systems, and computer applications.		*3*	*K3*	*CO6*

PART - B (Descriptive Answer Questions)
(6 × 11 = 66 Marks)
Answer ALL Questions

23.	a)	Choose the safety precautions in electroplating processes involving hazardous chemicals and its applications.	*11*	*K3*	*CO1*
		OR			
	b)	Identify the corrective actions based on safety audit findings in an industrial scenario.	*11*	*K3*	*CO1*
24.	a)	Select the appropriate fire prevention and firefighting methods for different types of industrial fire hazards.	*11*	*K3*	*CO2*
		OR			
	b)	Identify and explain the road safety principles and traffic control measures in highway and urban industrial environments to minimize accidents.	*11*	*K3*	*CO2*

25.	a)	Select the environmental protection practices and safety standards to control industrial hazards.	*11*	*K3*	*CO3*
		OR			
	b)	Identify the preventive measures for occupational diseases with examples.	*11*	*K3*	*CO3*
26.	a)	Utilize the different maintenance categories including preventive maintenance and repair cycles for effective maintenance management.	*11*	*K3*	*CO4*
		OR			
	b)	Select the suitable lubrication methods and maintenance practices to improve machine life and efficiency - Justify.	*11*	*K3*	*CO4*
27.	a)	Apply suitable wear debris analysis techniques to assess machine condition.	*11*	*K3*	*CO5*
		OR			
	b)	Identify the condition monitoring techniques for temperature measurement. Explain in detail.	*11*	*K3*	*CO5*
28.	a)	Demonstrate the implementation of safety control methods along with PPE usage in industrial operations.	*11*	*K3*	*CO6*
		OR			
	b)	Summarize the governing safety laws and regulations to ensure compliance and reduce industrial risks.	*11*	*K3*	*CO6*