Reg. No.												

Question Paper Code	12252

M.E. / M.Tech - DEGREE EXAMINATIONS, NOV / DEC 2023

Third Semester

M.E. - Industrial Safety Engineering

20PISEL301 – RELIABILITY ENGINEERING

(Regulations 2020)

Duration: 3 Hours Max. Marks: 100

PART - A (10 × 2 = 20 Marks)

Answer ALL Questions

		Marks, K-Level, CO
1.	Summarize how hazard rate is estimated.	*2,K1,CO1*
2.	Give a short note on reliability.	*2,K1,CO1*
3.	Brief about manual hazard plotting.	*2,K2,CO2*
4.	How plotting techniques and maintainability are inter related?	*2,K2,CO2*
5.	Examine reliability block diagram.	*2,K2,CO3*
6.	How are reliability and redundancy inter related?	*2,K1,CO3*
7.	Define reliability growth model.	*2,K1,CO4*
8.	Compare system reliability and component reliability.	*2,K2,CO4*
9.	Summarize about electric hazards.	*2,K2,CO5*
10.	List some characteristics of quantitative risk.	*2,K2,CO5*

PART - B (5 × 13 = 65 Marks)

Answer ALL Questions

11.	a)	Illustrate the priori and posteriori probabilities with suitable example.	*13,K2,CO1*
		OR	
	b)	Analyze reliability with reference to maintenance engineering. Also point out the importance of failure rate estimation in reliability.	*13,K3,CO1*
12.	a)	Ten units were tested at high stress test for up to 250 hours. Six failures occurred at 37, 73, 132, 195, 222 and 248 hours. Four units were taken off test without failing at the following run times: 50, 100, 200 and 250 hours. Compute the Cumulative hazard values.	*13,K4,CO2*
		OR	
	b)	Explain the importance of theoretical probability used in empirical methods.	*13,K3,CO2*

13. a) (i) Illustrate about repairable system analysis used in redundancy system. *7,K3,CO3*

(ii) Examine about series and parallel systems in reliability prediction models. *6,K3,CO3*

OR

b) Demonstrate the Baye's formula in reliability assessment perspective and derive the equation. *13,K3,CO3*

14. a) Compare fault tree and root cause analysis with respect to reliability replacement models. *13,K3,CO4*

OR

b) Deduce the replacement models and concurrent techniques used in reliability for monitoring. *13,K4,CO4*

15. a) Illustrate the functions of predictive techniques in industrial safety management. *13,K4,CO5*

OR

b) Examine the characteristics of operational availability in risk reduction. *13,K4,CO5*

PART - C (1 × 15 = 15 Marks)

16. a) Summarize the characteristics and functions of a bath tub curve and relate them to a concurrent example. *15,K4,CO6*

OR

b) Explain with a case study about the parameters involved in risk assessment and risk reduction. *15,K4,CO6*