Reg. No.												

Question Paper Code	13783

M.E. - DEGREE EXAMINATIONS, APRIL / MAY 2025

Second Semester

Industrial Safety Engineering

20PISPC204 / 24PISPC204 – SAFETY IN CHEMICAL INDUSTRIES

Regulations – 2020 / 2024

Duration: 3 Hours Max. Marks: 100

PART - A (10 × 2 = 20 Marks)

Answer ALL Questions

		Marks	K – Level	CO
1.	State the concept of inherent safer design.	2	K1	CO1
2.	Classify the various types of pressure relief valve.	2	K1	CO1
3.	Define post-commissioning in a chemical process plant.	2	K1	CO2
4.	List two common causes of pipeline corrosion**.**	2	K2	CO2
5.	Define operating discipline in chemical plant operations.	2	K1	CO3
6.	What is the purpose of a hand-over procedure in shift operations?	2	K1	CO3
7.	Define purging.	2	K1	CO4
8.	Differentiate between onsite emergency and offsite emergency**.**	2	K2	CO4
9.	What is meant by storage tank segregation**?**	2	K1	CO5
10.	List out the hazards in ammonia storages.	2	K2	CO6

PART - B (5 × 13 = 65 Marks)

Answer ALL Questions

			Marks	K – Level	CO
11.	a)	Explain various types of reactors and explain any three types of reactors with neat sketch.	13	K2	CO1
		OR			
	b)	Explain briefly the function of a heat exchanger with neat sketch.	13	K2	CO1
12.	a)	Elaborate in detail about pre commissioning and process commissioning documentation.	13	K2	CO2
		OR			
	b)	Describe the methods of non-destructive testing used in plant inspection. Discuss applications, limitations and selection criteria for NDT technique.	13	K2	CO2
13.	a)	Outline the critical steps involved in start-up and shutdown operations of a chemical or refinery unit. What hazards are commonly encountered during these phases?	13	K3	CO3

OR

	b)	Elaborate in detail about the operation of fired heaters, driers and storage.	*13*	*K3*	*CO3*
14.	a)	Discuss the processes and controls involved in managing plant modifications. What problems can arise if modifications are not properly controlled?	*13*	*K3*	*CO4*
		OR			
	b)	Explain the APELL program and its significance in industrial safety and community disaster preparedness.	*13*	*K3*	*CO4*
15.	a)	Describe different types of storage tanks and vessels used for petroleum products. Include design features related to pressure, temperature and safety.	*13*	*K3*	*CO5*
		OR			
	b)	Describe the unique challenges and safety considerations in storing LPG, storage layout, instrumentation and vaporizers.	*13*	*K3*	*CO5*

PART - C (1× 15 = 15 Marks)

16.	a)	As an officer in charge for safety in a multinational chemical plant, design and develop a work permit, to ensure an incident free site.	*13*	*K3*	*CO6*
		OR			
	b)	Discuss importance of maintenance of protective devices and safety instrumentation in process plants.	*13*	*K3*	*CO6*