

Reg. No.

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B.E. / B.TECH. DEGREE EXAMINATIONS, MAY 2023
 Second Semester
CH22201 – INTRODUCTION TO CHEMICAL ENGINEERING
(Chemical Engineering)
(Regulation 2022)

TIME: 3 HOURS**MAX. MARKS: 100**

COURSE OUTCOMES	STATEMENT	RBT LEVEL
CO 1	Analyze the history and future prospects of Chemical Engineering.	3
CO 2	Apply the basic Chemical Engineering Principles.	3
CO 3	Construct the Concepts of Momentum Transfer.	3
CO 4	Explore the Heat Transfer concepts and understand the working principle of Heat transfer equipments.	3
CO 5	Explain the Mass Transfer operations and its role in Chemical process industries.	3

PART- A (20 x 2 = 40 Marks)
 (Answer all Questions)

	CO	RBT LEVEL
1. Indicate any two greatest achievements of Chemical Engineering.	1	2
2. Cite few allied industries where chemical engineers can be employed.	1	2
3. Write any four chemical engineering principles involved in your day to day life.	1	3
4. Differentiate Unit Operations and Unit Processes with example.	1	3
5. Show how the average molecular weight of a mixture is calculated?	2	3
6. Write the unit of rate constant for a first order and second order reaction.	2	2
7. Classify the thermodynamic properties of fluids with example.	2	2
8. In a double effect evaporator plant, the second effect is maintained under vacuum of 400 torr. Calculate the absolute pressure in kPa.	2	3
9. Differentiate compressible and incompressible fluid.	3	2
10. Give the value of n in power law for Newtonian fluid with example.	3	3
11. Write the difference between fan and blowers.	3	2
12. Indicate the two popular pumps used in process industries.	3	2
13. Indicate the three modes of heat transfer. Mention about the mechanism of conduction	4	2
14. Draw neat sketch of a triple effect evaporator.	4	2
15. Indicate the role of baffle in a Shell and Tube Heat Exchanger.	4	4
16. Identify the type of flow arrangement gives maximum efficiency in a shell and tube heat exchanger and why?	4	2
17. State Fick's law of diffusion and explain the terms.	5	2
18. Indicate the significance of reflux ratio in distillation operation.	5	2
19. Write about absorption and stripping factor.	5	2
20. Illustrate Constant rate period in drying operation.	5	2

PART- B (5 x 10 = 50 Marks)

		Marks	CO	RBT LEVEL
21. (a)	Write the historical overview about the evolution of Chemical Engineering.	(10)	1	4
	(OR)			
(b)	Explain in detailed about the opportunity and future prospects of chemical Engineers in your point of view.	(10)	1	4
22. (a)	Pressure drop of a homogeneous fluid in a straight smooth pipe (ΔP) is a function of the pipe geometry (diameter d , and length l), the physical properties of the fluid (density ρ and viscosity μ) as well as its velocity v . Using dimensional analysis, find out the relationship between dimensionless groups	(10)	2	3
	(OR)			
(b)	(i) Compare the following with example: state and path functions	(5)	2	3
	(ii) Estimate the density of chlorine gas at temperature 503K(230°C) and 15.2MPa pressure using ideal gas law	(5)	2	3
23. (a)	(i) Explain the rheological behavior of fluids	(5)	3	3
	(ii) Explain the working principles of orifice meter with a neat diagram.	(5)	3	3
	(OR)			
(b)	(i) Explain any five properties of fluids.	(6)	3	3
	(ii) Classify the types of stress with example.	(4)	3	3
24. (a)	Analyze the different types of heat exchangers available and explain any one with neat diagram.	(10)	4	3
	(OR)			
(b)	Indicate any four types of evaporators. Explain the features of a short tube evaporator with neat sketch	(10)	4	3
25. (a)	Explain any five industrial adsorbent and their applications.	(10)	5	3
	(OR)			
(b)	Explain in detail about different types of dryers used in industry.	(10)	5	3

PART- C (1 x 10 = 10 Marks)

(Q.No.26 is compulsory)

		Marks	CO	RBT LEVEL
26.	Develop the expressions of any three dimensionless numbers from their physical significances and show these numbers are dimensionless.	(10)	2	5
