A **Reg. No. :** | | | | | | | | | | | | |

Question Paper Code: R2905

B.E. / B.Tech. DEGREE EXAMINATION, APRIL 2024

Second Semester

Chemical Engineering

R21UCH205 - INTRODUCTION TO CHEMICAL ENGINEERING

(Regulation R2021)

Duration: Three hours Maximum: 100 Marks

Answer All Questions

PART A - (10 x 1 = 10 Marks)

1. A first liquid evaporates at which of the following conditions? CO1-U

   (a) Low vapor pressure (b) High attraction forces

   (c) High boiling point (d) Low attraction forces

2. The type of check sheet used to monitor the input parameters that can affect the occurrence of defects in a process is called a CO1- U

   (a) Process distribution check sheet (b) Defective item check sheet

   (c) Defect location check sheet (d) Defect factor check sheet

3. "The velocity of entrance and exit through a nozzle remains the same." Is this ever possible? CO1- U

   (a) Only if the flow is compressible (b) Only if the flow is laminar

   (c) Only if the flow is rotational (d) Never possible

4. For a fully-developed pipe flow, how does the pressure vary with the length of the pipe? CO1- U

   (a) Linearly (b) Parabolic (c) Exponential (d) Constant

5. Radiation heat transfer is characterized by CO1- U

   (a) Movement of discrete packets of energy as electro-magnetic waves

   (b) Due to bulk fluid motion, there is a transport of energy

   (c) There is the circulation of fluid by buoyancy effects

   (d) Thermal energy transfer as vibrational energy in the lattice structure of the material

6. What are the basic methods of distillation? CO1- U

(a) Fractional distillation and simple distillation

(b) Fractional distillation, destructive distillation and simple distillation

(c) Steam distillation, simple distillation and gas distillation

(d) Steam distillation and destructive distillation

7. What is R in the equation $k = Ae^{-Ea/RT?}$ CO1- U

(a) R =8.314 J K^{-1} mol^{-1} (b) R=3.184 J K^{-1} mol^{-1}

(c) R = 4.318 J K^{-1} mol^{-1} (d) R =1.438 J K^{1} mol^{-1}

8. The mass of water vapour per unit mass of bone dry air is called CO1- U

(a) Relative saturation (b) Relative Humidity

(c) Humidity (d) None of the mentioned

9. Which of the following does NOT constitute 90% of dry weight of any food? CO1 -U

(a) Carbohydrates (b) Fibers (c) Proteins (d) Fats

10. Forbidden Energy gap (EG) of a semiconductor in electronic devices depends on which of the following factors? CO1 -U

(a) Interatomic distance (b) Material constant

(c) Electron affinity (d) Recombination and Generation

PART – B (5 x 2= 10Marks)

11. What does a Chemical Engineer do exactly? CO1 -U

12. What are the seven-dimension units? CO1- U

13. What is heat transfer? CO1- U

14. Why are reactors important? CO1- U

15. What is the use of mathematics in chemical engineering? CO1 -U

PART – C (5 x 16= 80Marks)

16. (a) Describe about the Outline of Chemical Engineering. CO1 -U (16)

Or

(b) Explain briefly about the Unit process in Chemical Engineering. CO1- U (16)

17. (a) Classify briefly about the Types of fluid. CO1 -U (16)

Or

(b) Explain with a neat sketch the Boundary layers. CO1 -U (16)

18.	(a)	Distinguish between Humidification and dehumidification	CO3 -Ana	(16)
		Or		
	(b)	Distinguish between Absorption and Adsorption.	CO3-Ana	(16)
19.	(a)	Explain about the Chemical Kinetics.	CO1- U	(16)
		Or		
	(b)	Describe briefly about the Flow Meter	CO1- U	(16)
20.	(a)	With neat sketch briefly explain about the role of chemical engineer in food industry.	CO2 -App	(16)
		Or		
	(b)	With neat sketch briefly explain about the role of chemical engineering in the Environmental Studies.	CO2 -App	(16)