Register No.:   ……………………………   Name: ……………………………………………………………

SAINTGITS COLLEGE OF ENGINEERING (AUTONOMOUS)

(AFFILIATED TO APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY, THIRUVANANTHAPURAM)

THIRD SEMESTERB.TECH DEGREE EXAMINATION (Regular), FEBRUARY 2022
(2020 SCHEME)

Course Code:	**20CHT281**
Course Name:	**Introduction to Chemical Engineering**
Max. Marks:	**100** **Duration: 3 Hours**

PART A
(Answer all questions. Each question carries 3 marks)

1. List out any six chemical products which are having application in our daily life.
2. Describe about any three basic features of a chemical industry.
3. Differentiate between vapour pressure and partial pressure.
4. Define Henry's law and Raoult's law.
5. Differentiate between absorption and adsorption.
6. Differentiate between unit operations and unit processes with any two examples.
7. Define the terms rate, order and molecularity for a chemical reaction.
8. Distinguish between laminar and turbulent flow.
9. List out any six sources for air pollution.
10. Discuss the impacts of any three process hazards in a chemical industry.

PART B
(Answer one full question from each module, each question carries 14 marks)

MODULE I

11. a) Write short note on the origin of Chemical Engineering and its evolution as a profession. (6)
    b) Write short note on process development and process design. (8)

OR

12. a) Differentiate between the roles of a Chemist and a Chemical Engineer. (6)
    b) List out the names of any three chemical industries in India. Discuss about the raw materials used and the process involved in those industries. (8)

MODULE II

13. a) Differentiate between molarity, molality and normality. (6)
    b) A solution of caustic soda contains 20% NaOH by weight. Taking density of the solution as 1.196 kg/l, find the normality, molarity and molality of the solution. Molecular weight of NaOH is 40 g/mol. (8)

OR

14. a) Illustrate the characteristic features of ideal gas and real gas with suitable (6)

equations.

b) Sodium chloride weighing 200 kg is mixed with 600 kg potassium chloride. Calculate the composition of the mixture in i) weight % and ii) mole %. Molecular weight of NaCl and KCl are 58.44 g/mol and 74.55 g/mol, respectively.   (8)

MODULE III

15. a) Explain saponification process and its industrial applications.   (5)
    b) Describe the working of any three size reduction equipments.   (9)

OR

16. a) Explain crystallization operation with a suitable industrial application.   (6)
    b) Describe the manufacturing process of biodiesel with a flow diagram.   (8)

MODULE IV

17. a) With a neat sketch explain the components and working of a shell and tube heat exchanger.   (8)
    b) Differentiate between the three commonly used reactor configurations – batch, mixed flow and plug flow reactor.   (6)

OR

18. a) With a neat sketch explain the working of a venturimeter.   (8)
    b) Describe the principle and governing law of the three modes of heat transfer.   (6)

MODULE V

19. a) With a neat sketch explain the working of a typical wastewater treatment system.   (8)
    b) What were the possible causes of 'Bhopal Gas Tragedy'? Suggest any two measures that should have taken in order to prevent the disaster.   (6)

OR

20. a) Discuss any three solid waste management systems which are commonly employed in developing countries.   (6)
    b) Illustrate the effects of aerial spraying of 'Endosulfan' on a particular location at Kasargod, Kerala   (8)

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