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APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
FIRST SEMESTER B.TECH DEGREE EXAMINATION, DECEMBER 2017
Course Code: BE101-06
Course Name: INTRODUCTION TO CHEMICAL ENGINEERING

Max. Marks: 100   Duration: 3 Hours

PART A
Answer all questions, each carries 3 marks.

1	Who is considered to be the father of Chemical Engineering? What is his contribution?	(3)
2	Give three terms of expressing compositions of a gas mixture.	(3)
3	Give an example for the industrial use of 'distillation'	(3)
4	Define 'yield' in a chemical reaction.	(3)
5	What is the information available in a Process Flow Diagram?	(3)
6	Give the principle of flow measurement using a venturi meter.	(3)
7	Give three examples for novel materials with their application.	(3)
8	Define Biochemical Oxygen Demand.	(3)

PART B
Answer eight questions, (at least one full question from each module) each carries 5 marks.
Module I

9	List five different professional fields of Chemical Engineering with their primary role.	(5)

Module II

10	The heat transfer coefficient of oil flowing through a pipe is 300W/(m^{2}K). Determine the value of heat transfer coefficient expressed in kcal/(hm^2°C), Btu/(hft^2°F).	(5)

Module III

11	Explain the unit operation of drying. Give an industrial example with the name of the Dryer.	(5)
12	Define saponification value. What is its significance in saponification process?	(5)

Module IV

13	Differentiate between Mixed flow reactor and Plug flow reactor.	(5)
14	Write in brief about 'laminar and turbulent flow'.	(5)

Module V

15	Explain the elements of a typical feedback control loop.	(5)
16	With a neat PFD explain the manufacture of Sulphuric acid.	(5)

Module VI

17	List the methods for removal particulate matter from polluted air. Explain any two	(5)

with the help of a sketch.

18   Safety is the most crucial point in all the aspects such as design and operation of a   (5)
       chemical process industry. Explain.

PART C
Answer sixquestions, (at least one full question from each module) each carries 6 marks.
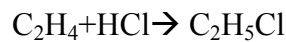### Module I
19   Classify chemical industries to give any six classes.   (6)
Module II
20   Air contains 78.08 % N_2, 20.95% O_2, 0.93% Argon and remaining CO_2 by mole.   (6)
       Express the composition by weight. Also find the density of air at NTP (Normal
       Temperature and Pressure, 25^0C and 1 am). Given that molecular weight of Argon
       = 40.
21   Ethyl Chloride is produced by the gas phase reaction of HCl with Ethylene as   (6)
       follows
              $C_2H_4 + HCl \rightarrow C_2H_5Cl$
       Find the weight of raw materials needed to make 100 kilograms per hour Ethyl
       Chloride.
Module III
22   Explain the unit process of hydrogenation of oil.   (6)
Module IV
23   Classify chemical reactions. Give example for each class.   (6)
24   Explain in detail the effect of temperature on rate of a Chemical reaction.   (6)
Module V
25   Explain the roles of Process Instrumentation in monitoring the control Chemical   (6)
       plants.
Module VI
26   Solid waste management has become a serious environmental problem addressed   (6)
       by the society in recent years. Give your views in tacking the issue.
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