Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

B.Tech Degree S1,S2(S,FE) Examination May 2021 (2015 Scheme)

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

		Marks
1	Write the stages involved in process design.	(3)
2	Define partial pressure and vapour pressure	(3)
3	List any three industrial applications of distillation.	(3)
4	Distinguish between conversion and yield of a chemical process.	(3)
5	Differentiate between block diagram and process flow diagram.	(3)
6	Explain the working principle of thermocouples.	(3)
7	Name any three air pollutants and its adverse effect in human body.	(3)
8	Write any three physical parameters for describing industrial waste water.	(3)

PART B

Answer eight questions, (at least one full question from each module)

Module I

9	Give an overview of chemical industries in Kerala.	(5)

Module II

10	Ethyl Chloride is produced by the gas phase reaction of HCl with Ethylene as Follows $C_2H_4+HCl \rightarrow C_2H_5Cl$ Find the mass flow rate of raw materials needed to make 50 kilograms per hour Ethyl Chloride.	(5)

Module III

11	Differentiate evaporation and drying.	(5)
12	SO_3 gas is obtained by the combustion of the FeS_2 according to the reaction $4FeS_2 +15O_2 \rightarrow 2 Fe_2O_3+8SO3$ How many kilograms of pyrites are burned to obtain $200m^3$ of Fe_2O_3? (specific gravity of Fe_2O_3=5.2)	(5)

Module IV

13	Define rate of a reaction. What are the factors affecting rate of a reaction.	(5)
14	Explain classification of chemical reactions.	(5)

Module V

15	Draw P&ID symbols for any 5 instruments used in process piping.	(5)
16	With a neat diagram explain principle and working of a venturi meter in flow measurement.	(5)

Module VI

17	List any five novel materials and their uses.	(5)
18	"Safety isn't expensive, it's priceless". Justify the statement as a chemical engineer.	(5)

PART C

Answer six questions, (at least one full question from each module)

Module I

19	Explain various sectors of chemical industries.	(6)

Module II

20	Write a note on mole%, mole fraction, mole ratio, weight %, weight fraction, weight ratio, volume %, volume fraction and volume ratio.	(6)
21	Define the term equation of state. Write any three equations of state explaining the various terms involved.	(6)

Module III

22	Explain the process of production of biodiesel.	(6)

Module IV

23	Explain the laws of thermal radiation.	(6)
24	With help of a diagram explain the features of CSTR and PFR.	(6)

Module V

25	With a neat diagram explain working of a distillation column. Explain different control strategies that can be implemented to control the distillate quality.	(6)

Module VI

26	What are the different challenges for chemical engineers in chemical plant safety?	(6)

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