

**VIT[®]****Vellore Institute of Technology**
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SCHOOL OF BIO SCIENCES AND TECHNOLOGY
CONTINUOUS ASSESSMENT TEST -I
WINTER SEMESTER 2024-2025

Programme Name & Branch	: M.Sc. Integrated Biotechnology
Course Code	: TBIT 206L
Course Name	: Fundamentals of Chemical Engineering
Slot	: B1 + TB1
Faculty Name(s)	: Dr. Venkat Kumar S, Dr. Dhanya V
Class Number(s)	: VL2024250501290, VL2024250501291
Date of Examination	: 28-JAN-2025
Exam Duration	: 90 minutes

Maximum Marks: 50

General instruction(s): Answer all the questions.

Q. No	Question	Marks
1.	An aqueous solution contains 43 g of K_2CO_3 in 100 g of water. The density of solution is 1.3 g/cc. Find the composition in molarity, normality and molality.	10
2.	A liquid mixture of butane, pentane and hexane has the following composition in weight percentage; butane 50%, pentane 30% and hexane 20%. Calculate weight fraction of each component, mole fraction of each component, mole % of each component and average molecular weight.	10
3.	Cracked gas from a petroleum refinery has the following composition by volume, methane 45%, ethane 10%, ethylene 25%, propane 7%, propylene 8%, butane 5%. Find (a) average molecular weight of the gas mixture (b) composition by weight. (c) specific gravity of the mixture	10
4.	Calculate the average molecular weight and composition by weight of air (N_2 - 78.084%, O_2 - 21%, Argon - 1%, All % are volume %)	10
5.	A natural gas has the following composition by volume CH_4 : 83.5%, C_2H_6 : 12.5%, and N_2 : 4%. Calculate the following: (a) Composition in mole % (b) Composition in weight % (c) Average molecular weight (d) density at standard condition (kg/m^3).	10