



**K. K. Wagh Institute of Engineering Education & Research, Nashik**  
(An Autonomous Institute From A.Y. 2022-23)

InSem Examination-II Summer 2025	
Exam Seat No.:	
Academic Year: 2024-2025	Semester: IV
Class: SY	Program: B.Tech
Branch Code: CHE	Pattern: 2023
Name of Course: Process Calculations	Course Code: 2307211
Max. Marks: 30	Duration: 1.15 Hrs.

**Instructions:** Candidates should read carefully the instructions printed on the Question Paper and on the cover page of the Answer Book, which is provided for their use.

1. This question paper contains 1 page.
2. Answer to each new question is to be started on a new page.
3. Assume suitable data wherever required, but justify it.
4. Draw the neat labelled diagrams, wherever necessary.
5. The last columns indicates the Course Outcome of the Question.

**Marks CO**

**Question No. 1**

- 1 a) Write the difference between Molarity, Molality and Normality and their applications in chemical process industries? (7) CO1

**Question No. 2**

- 2 a) A gas contained in a closed vessel at a pressure of 1.2 atm and 299 K is heated to a temperature of 1250 K. Calculate the pressure to which a closed vessel should be designed. (8) CO1

**OR**

- 2 b) The strength of aqueous solution of soda ash is specified as 15% Na<sub>2</sub>O by weight. Express the composition in terms of weight per cent soda ash. (8) CO1

**Question No. 3**

- 3 a) What is the difference between Evaporation and Distillation. Explain material balance of Evaporation and Distillation with neat block diagram. (7) CO2

**Question No. 4**

- 4 a) 2000kg of wet solid containing 70 % solids by weight are fed to a tray dryer where it is dried by hot air. The product finally obtained is found to contain 1 % moisture by weight calculate the Kg of water removed from wet solids and Kg of product obtained. (8) CO2

**OR**

- 4 b) 10000 Kg/hr of solution containing 20% methanol is continuously fed to a distillation column. Distillate (Product) is found to contain 98 % methanol and waste solution from column carries 1% methanol. All percentage are by weight. Calculate a). the mass flow rate of distillate and bottom product and, b). The percent loss of methyl alcohol. (8) CO2

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