BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(MID SEMESTER EXAMINATION)

CLASS: IMSc **SEMESTER: VI**
BRANCH: FOOD TECHNOLOGY **SESSION :SP/2024**

SUBJECT: FT309 MASS TRANSFER IN FOOD PROCESSING

TIME: 2 HOURS **FULL MARKS: 25**

INSTRUCTIONS:
1. The total marks of the questions are 25.
2. Candidates attempt for all 25 marks.
3. Before attempting the question paper, be sure that you have got the correct question paper.
4. The missing data, if any, may be assumed suitably.
5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.

Q1	Derive from fundamentals the expression for steady state equimolar counter diffusion of gas A through another gas B	[5]	CO-1	L2
Q2	Calculate the rate of diffusion of hydrogen (A) through nondiffusing methane (B) at 25^0Cand 101 kN/m^2 pressure (D_{AB} = 6.6 x 10^{-5} m^2/s). The diffusion path is 5 mm long and the concentration of hydrogen at the two ends of the path in terms of partial pressure is 12 kN/m^2 and 8.4 kN/m^2 respectively.)	[5]	CO-1	L2
Q3	A sphere of naphthalene having a radius of 2.0 mm is suspended in a large volume of still air at 318K and 1.01325X10^5 Pa (1 atm). The surface temperature of the naphthalene can be assumed to be at 318K and its vapor pressure at 318K is 0.555 mm of Hg. The D_{AB} of naphthalene in air at 318K is 6.92X10^{-6} m^2/s. Calculate the rate of evaporation of naphthalene from the surface.	[5]	CO-1	L2
Q4	Discuss application of Azeotropic and Reactive distillation. Give Flow sheet to explain the processes.	[5]	CO-2	L2
Q5	Soyabean seed are extracted with hexane in batch Extracter. The flaked seed contain 18.6% oil, 69.0% solid and 12.4 % moisture. At the end of the process, cake of milk is separated from the hexane oil mixture. The cake analysis yield 0.8% oil, 87.7% solid and 11% moisture. Find the % recovery of oil. All % are by wt only.	[5]	CO-3	L2

::::::20/02/2024::::::M