B.E. (Chemical)-MBA + B.E. (Food Tech.) - 3rd Semester

Second Periodicals (20.01.2022)

Chemical Engineering Thermodynamics

Time: 60 minutes **Max. Marks: 25**

Q1.	Write short notes on following:		(5)
	i.	Chemical Potential	
	ii.	Lewis-Randel Rule	
	iii.	Fugacity	Course
	iv.	Activity	Outcome
	v.	Excess properties	3,4
Q2.	Derive the Gibbs Duhem equation with the assumptions. Derive the various forms of Gibbs Duhem equation.		(5) Course Outcome 5
Q3.	At 300K and 1 bar the volumetric data for a liquid mixture of benzene and cyclohexane are represented by $V = 109.4 \times 10^{-6} - 16.8 \times 10^{-6} X_1 - 2.64 \times 10^{-6} X_1^2$ where X_1 is the mole fraction of the benzene and V has the units of m^3/mol. Find the expressions for the partial molar volumes of benzene and cyclohexane.		(5) Course Outcome 3
Q4.	What is the effect of temperature and pressure on activity coefficient?		(5) Course Outcome 4
Q5.	i.	Write the applications of Gibbs-Duhem Equation in solution thermodynamics.	(5)
	ii.	The standard heat of formation and standard free energy of formation of ammonia at 298 K are -46,100 J/mol and -16,500 J/mol respectively. Calculate the equilibrium constant for the reaction.	Course Outcome 5