Sanjay Ghodawat University, Kolhapur

2020-21

Established as State Private University under Govt. of Maharashtra. Act No XL, 2017

EXM/P/09/00

Year and Program: M. Sc. I 2020-21 | **School of Science** | **Department: Chemistry**

Course Code: CHS505 | **Course Title: Physical Chemistry-I** | **Semester : I**

Day and Date: | **Re-End Semester Examination** | **Time : 2 Hrs.** **Max Marks : 50**

Instructions: 1) All Questions are compulsory.

				Marks	Bloom's Level	CO
Q.1		**Answer the following**				
a)	i)	State and explain Raoult's law for ideal solution and differentiate between ideal and non-ideal solution.		4	L1	CO1
	ii)	Evaluate partial molar volume directly by intercept method to plot molal volume against mole fraction.		4	L2	CO1
b)	i)	Describe the Arrhenius theory.		4	L2	CO2
	ii)	Explain in brief Michaelis-Menten enzyme catalysis expression.		4	L2	CO2
			OR			
c)	i)	Write a note on Acid and Base catalyzed reactions in homogeneous catalysis.		4	L2	CO2
	ii)	Discuss in detail Erying equation.		4	L2	CO2
Q.2		**Answer the following**				
	a)	Explain in brief translational partition function and electronic partition function.		8	L3	CO3
	b)	Derive an expression for Maxwell-Boltzmann distribution law.		8	L4	CO3
			OR			
	c)	i) Calculate the translational partition function for benzene (molar mass = 78.0 g mol^{-1}) in a volume of 1 m^3 at 25°C. (Given: h = 6.626*10^{-34} Js, k = 1.38*10^{-23} JK^{-1}, N = 6.022*10^{23} mol^{-1} Avogadro's number).		4	L4	CO3

		ii) Calculate the characteristics rotational temperature and rotational partition function for H_2 gas at 2727^{o}C given that the moment if inertia of hydrogen gas molecule at this temperature is 4.6033×10^{-48} kg m^2. (Given; $\sigma = 2$, $h = 6.626*10^{-34}$ Js, $k = 1.38*10^{-23}$ JK^{-1})	4	L4	CO3
Q.3		**Answer the following**			
	a)	Describe in brief different types of Proteins.	9	L2	CO4
	b)	i) Discuss in detail structure of nucleic acids.	5	L3	CO4
		ii) Write a note Lenard- Jones potential.	4	L3	CO4
		OR			
	c)	i) Explain in detail Hydrophobic hydration and interaction.	5	L3	CO4
		ii) Write a note on H- Bonding.	4	L3	CO4

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