School of Basic and Applied Sciences

Chemistry

ETE - Jun 2023

Time : 3 Hours **Marks : 50**

Sem II - MSCH5024 - Physical Chemistry-II

Your answer should be specific to the question asked

Draw neat labeled diagrams wherever necessary

1.	Define Ensemble?	K1 CO1	(2)
2.	Explain quantum yield. What are the reasons for low quantum yield?	K2 CO3 ,CO2	(2)
3.	Explain why peaks corresponding to electronic transitions are broad as compared to vibrational and rotational spectroscopies?	K2 CO4	(2)
4.	Explain how potential varies with distance from electrode in electrified double layer?	K1 CO2	(2)
5.	Explain the effect of catalysts on rate of reaction?	K2 CO3	(2)
6.	Examine the raman spectra of a triatomic molecule where the first three lines are at 4.86, 8.14 and 11.36 cm-1. Determine the rotational constant, moment of inertia and the radius of the molecule?	K3 CO5	(5)
7.	Assume that a reaction undergoes acid catalysis by the following mechanism: $BH^+ + s \rightleftharpoons SH^+ + B$ $SH^+ + H2O \rightarrow P + H_3O^+$ Assuming that the substrate is in great excess of the catalyst and K-1[B] is greater that K2 derive the rate constant?	K4 CO5	(6)
8.	Examine the partition function of two Bose particles each of which can occupy any of the two energy levels having energy equal to 0 and E?	K3 CO6	(5)
9.	Explain why Helmholtz model fails to explain variation of capacitance with distance from electrode surface?	K4 CO4	(8)
10.	Justify mathematically the statement: contribution of vibrational partition function at low temperature towards internal energy is equal to zero?	K3 CO5	(8)
11.	Illustrate the mechanism and rate law equation for enzyme catalyzed reactions?	K4 CO4	(8)