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F.Y.B. Sc. (IISemester) Internal Test - 2014
SUB: Physical chemistry (US02CCHE02)

Date: 12/03/2014 Total marks: 30
Day: wednesday Time: 11.00am to 12.00pm
Note: All questions are to be attempted.Total number of questions are four.

Q.1. **Answer any three** [06]

i. Define: (i)Vaporization (ii)Viscosity
ii. Explain the terms cohesion and adhesion.
iii Give important properties of a state function.
iv Define: (i)Isothermal process (ii)Adiabatic process
v Define: (i) Order of reaction (ii) Molecularity of reaction.
vi Obtain the units of rate constants for first order and second order reaction.

Q.2. Define surface tension. Explain the effect of temperature on surface tension and discuss the capillary rise method for measurement of surface tension. [08]

OR

Q.2. Explain the term refractive index and how will you measure the refractive index of a liquid. [08]

Q.3.a. Prove that work is not a state function. [04]

b. When 78 g of benzene is burnt completely in oxygen to form liquid water and carbon dioxide gas, change in enthalpy is -781 Kcal at 25 degree centigrade. Calculate the value of change in internal energy of this reaction at constant volume in calories.(R-1.987 cal/mole.K) [04]

OR

Q.3. a. Derive kirchoff's equation for temperature dependence of change in enthalpy. [04]

b. Discuss the classification of system on the basis of number of phases present in a system and interaction between system and surrounding. [04]

Q.4. a. Derive integrated rate law for second order reaction and give its characteristics. [04]

b. For a certain chemical reaction, rate constant value at 298 K is 0.0503 M^{-1} S^{-1} and rate constant value at 333 K is 6.71 M^{-1}.Calculate activation energy in calories.(R- 1.987 cal/mole.K). [04]

OR

Q.4. a. State and explain the principle of microscopic reversibility for multistep reaction. [04]

b. What is reaction mechanism? Discuss the types of elementary processes for the reaction mechanism taking suitable illustrations. [04]

"God helps those who help themselves"