

VITHALBHAI PATEL & RAJRATNA. P.T.PATEL SCIENCE COLLEGE  
VALLABH VIDYANAGAR

F.Y.B. Sc. (IISemester) Internal Test - 2014

SUB: Physical chemistry (US02CCHE02)

Date: 12/03/2014

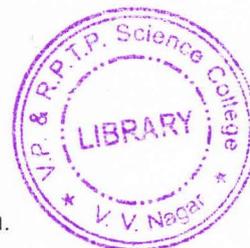
Day: wednesday

Note: All questions are to be attempted. Total number of questions are four.

Total marks: 30

Time: 11.00am to 12.00pm

- Q.1. Answer any three [06]
- Define: (i) Vaporization (ii) Viscosity
  - Explain the terms cohesion and adhesion.
  - Give important properties of a state function.
  - Define: (i) Isothermal process (ii) Adiabatic process
  - Define: (i) Order of reaction (ii) Molecularity of reaction.
  - 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  $0.0503 \text{ M}^{-1} \text{ S}^{-1}$  and rate constant value at 333 K is  $6.71 \text{ M}^{-1}$ . 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"*