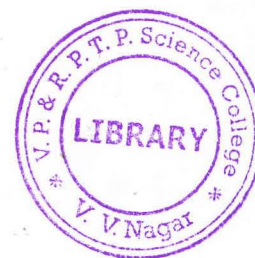


V.P. & R.P.T.P. SCIENCE COLLEGE, VALLABH VIDYANAGAR
B.Sc. (SEMESTER –II) INTERNAL EXAMINATION
Thursday, 9th March 2017
1.30 pm – 2.30 pm
PHYSICAL CHEMISTRY: US02CCHE02

Marks-25
(03)

Q – 1 Select one most appropriate response out of the four provided to you.

- (i) The liquid cools itself upon vaporization, because
(a) the average energy of the remaining molecules in liquid will decrease
(b) the average kinetic energy of the remaining molecules in liquid will decrease
(c) vaporization of a liquid is temperature dependent process
(d) none of the above
- (ii) Which of the following has always negative value?
(a) heat of formation (b) heat of reaction (c) heat of combustion (d) heat of solution
- (iii) Order of reaction indicates
(a) change in concentration of reacting molecules due to the chemical reaction
(b) change in concentration of product
(c) number of species participating in overall chemical reaction
(d) none of the above



Q-2 Give answers of any two questions given below.

(04)

- (i) Explain the term Reynolds number.
(ii) Classify the system according to number of phases present in the system.
(iii) Define reaction mechanism and principle of microscopic reversibility.

Q-3 Write a note on vapor pressure of a liquid.

(06)

OR

Q-3 (a) Describe the double capillary rise method for the measurement of surface tension.

(03)

- (b) Benzene takes 46 seconds to flow through an Ostwald viscometer while water takes 68 second at the same temperature. Their respective densities are 0.8 gmcm^{-3} and 0.998 gmcm^{-3} . Coefficient of viscosity of water at the prevailing temperature is 1.008 centipoise. Calculate the coefficient of viscosity of benzene.**

(03)

Q-4 (a) Define heat capacity. Establish the relation between C_p and C_v .

(03)

- (b) When one mole of ice melts at 0°C and constant pressure of 1 atm, 1440 cal of heat absorbed by the system. The volumes of ice and water are 0.0196 and 0.0180 liter respectively. Calculate ΔH and ΔE .**

(03)

OR

Q-4 (a) Define internal energy. Prove that internal energy is a state function.

(03)

- (b) The standard heat of formation of gaseous NH_3 is -11.02 kcal/mole at 298 K. At 298 K and constant pressure, heat capacities of N_2 , H_2 and NH_3 are 6.96, 6.89 and 8.38 $\text{cal deg}^{-1}\text{mol}^{-1}$ respectively. Calculate ΔH_{773}° for the reaction $\frac{1}{2} \text{N}_2 + \frac{3}{2} \text{H}_2 \rightarrow \text{NH}_3$.**

(03)

Q-5 Define integrated rate law and derive the expression for second order reaction and give its characteristics.

(06)

Q-5 (a) List the experimental methods to determine the rate law and describe any one.

(03)

- (b) 45% of a first order reaction is completed in 40 min. How long will it take to be completed 70% ?**

(03)