

GUJARAT TECHNOLOGICAL UNIVERSITY
B.Pharm - SEMESTER– II • EXAMINATION – SUMMER 2017

Subject Code: 2220002

Date: 07/06/2017

Subject Name: Pharmaceutical Chemistry-II (Physical Chemistry)

Time: 10:30 AM to 01:30 PM

Total Marks: 80

Instructions:

1. Attempt any five questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1** (a) What is Surface tension? Derive equation to determine surface tension by capillary rise method. **06**
- (b) Define following terms: **05**
1. Viscosity
 2. Optical activity
 3. Partition Coefficient
 4. Conductance
 5. Refractive Index
- (c) Define parachor and dipole moment. Give their application in molecular structure determination. **05**
- Q.2** (a) Give basic classification of solutions. Give detail difference between ideal and real solutions. **06**
- (b) Define colligative properties. Explain Depression of Freezing point. **05**
- (c) A solution containing 2.44 gm of solute dissolved in 75 gm of water boiled at 373.413 K. Calculate molecular mass of solute. (k_b of water is 0.52 K, Boiling point of pure water 100°C) **05**
- Q.3** (a) Define Adsorption isotherm. Write a short note on Langmuir adsorption isotherm. **06**
- (b) Give detail difference between physical and chemical adsorption. **05**
- (c) Write a short note on Henry's law. **05**
- Q.4** (a) Derive equation of rate of reaction and half life for first order kinetics. **06**
- (b) Write a short note on second order reaction. **05**
- (c) 50% first order reaction is completed in 23 minutes. Calculate the time required to complete 90% of the reaction. **05**
- Q.5** (a) Explain difference between: **06**
1. Homogeneous and heterogeneous catalysis.
 2. Order of reaction and molecularity.
 3. Adsorption and Absorption.

- (b) Write a short note on theories of catalysis with mechanism. **05**
(c) Define: **05**
1. Promoter
 2. Autocatalysis
 3. Heat of combustion
 4. Heat of Neutralisation
 5. Degree of freedom
- Q. 6** (a) Define thermodynamics. State and explain first law of thermodynamics with various modification and limitations. **06**
(b) Write a short on various thermodynamic processes. **05**
(c) Give equation of work for reversible expansion of ideal gas. **05**
Calculate work done when one mole of an ideal gas at 25°C is allowed to expand reversibly at constant temperature from a volume of 10 liters to 20 liters. ($R=8.31 \text{ J K}^{-1} \text{ Mol}^{-1}$)
- Q.7** (a) Write a short note on one-component system with example. **06**
(b) Explain Jablonski diagram for various photochemical processes in detail. **05**
(c) State and explain Lambert-Beer's law of Photochemistry. **05**
