

S.Y.B.SC. SEM – IV (CBCS - 2016 Course) : SUMMER - 2019
SUBJECT : CHEMISTRY : PHYSICAL & ANALYTICAL CHEMISTRY – II

Day : Wednesday
Date : 08/05/2019

Time : 11.00 A.M. To 02.00 P.M.
Max. Marks : 60

S-2019-0842

N.B.:

- 1) All questions are **COMPULSORY**.
- 2) Figures to the right indicate **FULL** marks.
- 3) Use of scientific **CALCULATOR** is allowed.
- 4) Answers to both the sections should be written in the **SAME** answer book.

SECTION – I (Physical Chemistry)

- Q.1** Attempt **ANY TWO** of the following: [12]
- a) What are simultaneous reactions? Explain opposing reaction with suitable examples.
 - b) State and explain Raoult's law.
 - c) Discuss the term colloids.
- Q.2** Attempt **ANY THREE** of the following: [12]
- a) Explain the collision theory.
 - b) 5×10^{-3} kg of urea is dissolved in 2×10^{-2} kg of water. Calculate the percent by mass of urea.
 - c) The strength of HCl solution is 1.825 gm / lit. If the equivalent weight of HCl is 36.5, what is its normality?
 - d) The rate constants for the decomposition of N_2O_5 at 273 K is 7.87×10^{-7} and at 298 K is 3.45×10^{-6} respectively. Calculate the energy of activation. The value of $R = 8.368$ Joules.
- Q.3** **A)** Attempt **ANY ONE** of the following: [06]
- i) Discuss phenol-water system.
 - ii) Describe the term mole fraction.

SECTION – II (Analytical Chemistry)

- Q.3** **B)** Attempt **ANY ONE** of the following: [06]
- a) "The equivalent weight of the substance changes from one type of the reaction to the other". Explain with suitable example.
 - b) Describe the method of standardisation of $Na_2S_2O_3$ with potassium dichromate.
- Q.4** Attempt **ANY TWO** of the following: [12]
- a) What is bleaching powder? Describe the method of estimation of available chlorine in bleaching powder.
 - b) How will you prepare 0.1N iodine solution? Give the method of standardization of I_2 solution with sodium thiosulphate solution.
 - c) What is a titration curve? Explain the titration curve of strong acid and strong base. Which indicator will you choose for this titration? Why?
- Q.5** Attempt **ANY FOUR** of the following: [12]
- a) How will you calibrate a pipette?
 - b) Define: **i)** End point **ii)** Suitable indicator **iii)** Best indicator
 - c) What is primary standard substance? What are the requirements of a primary standard?
 - d) How many ml of 0.1 N HCl should be added to neutralize 25 ml of 0.1N NH_4OH ?
 - e) How much water should be added to 250 ml of 0.1 N NaOH to give 0.05 N solution?
 - f) What volume of water should be added to 1000 ml of 0.125 N reagent to prepare exactly 0.1 N solution.

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