

BACHELOR OF SCIENCE (CBCS-2018 COURSE)
S. Y. B. Sc. Sem-IV : WINTER :- 2021
SUBJECT: CHEMISTRY : PHYSICAL & ANALYTICAL CHEMISTRY-II

Day : Saturday
Date 22-01-2022

W-18380-2021

Time : 02:00 PM-05:00 PM
Max. Marks: 60

N.B.:

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

SECTION – I

- Q.1** Attempt **ANY TWO** of the following: [12]
- a) Distinguish between ideal and non-ideal solutions.
 - b) What are simultaneous reactions? Explain opposing reaction with suitable examples.
 - c) Explain the process of steam distillation.
- Q.2** Attempt **ANY THREE** of the following: [12]
- a) Elaborate on electrical precipitation of smoke.
 - b) A solution is prepared by dissolving certain amount of solute in 500 gm of water. The percentage by mass of a solution is 2.38. Calculate mass of solute.
 - c) The rate constant for a chemical reaction at 599 K is $\frac{1}{7}$ times that at 661K. Calculate the energy of activation ($R = 8.314 \text{ JK}^{-1} \text{ mol}^{-1}$).
 - d) 5×10^{-3} Kg of urea is dissolved in 2×10^{-2} Kg. Calculate percent by mass of urea.
- Q.3** a) Attempt **ANY ONE** of the following: [06]
- i) What are different types of solutions? Give their examples.
 - ii) Discuss the collision theory.

SECTION – II

- Q.3** b) Attempt **ANY ONE** of the following: [06]
- i) Describe determination of chloride by Mohr's method.
 - ii) Describe the standardization of sodium thiosulphate solution by potassium dichromate.
- Q.4** Attempt **ANY TWO** of the following: [12]
- a) Explain the titration curve for a strong acid and a weak base. At the equivalence point, why the pH is on the acidic side? Which indicator will you choose for this titration? Why?
 - b) What is a secondary standard? How does it differ from a primary standard?
 - c) Write a note on 'complexometric titration'.
- Q.5** Attempt **ANY FOUR** of the following: [12]
- a) How will you calculate equivalent weight of potassium iodate?
 - b) How will you calibrate a pipette?
 - c) What are mixed indicators? Why are they used?
 - d) How much water should be added to 500 ml 0.5N NaOH to give 0.1N solution?
 - e) How many ml of 0.2 N acid are required to neutralize 25 ml of 0.1N NaOH solution?
 - f) If 25.20 ml of 0.2703 N acid reacts with 35.10 ml of base. What is the normality of the base?

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