

**S.Y.B.SC. SEM – IV (CBCS - 2016 COURSE) : SUMMER - 2018**  
**SUBJECT: CHEMISTRY: PHYSICAL & ANALYTICAL CHEMISTRY-II**

Day: **Friday**  
Date: **13/04/2018**

**S-2018-0663**

Time: **11.00 A.M. TO 02.00 PM**  
Max. Marks: 60

**N.B:**

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

**SECTION-I (Physical Chemistry)**

- Q.1** Attempt **ANY TWO** of the following: **(12)**
- a) Discuss the chain reaction with examples.
  - b) Describe electrical precipitation of smoke.
  - c) Draw vapour pressure composition and boiling point composition diagrams.
- Q.2** Attempt **ANY THREE** of the following: **(12)**
- a) For a certain reaction the temperature coefficient  $\frac{K_{35}}{K_{25}}$  is equal to 1.75. Calculate the energy of activation.  $R = 2$  cal.
  - b) Find the normality of
    - i) 0.1M  $H_2SO_4$
    - ii) 0.05M  $H_3PO_4$
    - iii) 0.3M  $Ca(OH)_2$
    - iv) 0.1M  $Cr(OH)_3$
  - c)  $5 \times 10^{-3}$  kg of urea is dissolved in  $2 \times 10^{-2}$  kg of water. Calculate the percent by mass of urea.
  - d) Mention the use of colloids in food products.
- Q.3** A) Attempt **ANY ONE** of the following: **(06)**
- a) Obtain the expression for energy of activation starting with Arrhenius equation.
  - b) Give the list of nine types solutions with example.

**SECTION-II (Analytical Chemistry)**

- Q.3** A) Attempt **ANY ONE** of the following: **(06)**
- a) What is primary and secondary standard substance? Explain with example. How it differ from a primary standard.
  - b) Describe the method of standardization of Iodine with  $Na_2S_2O_3$  solution.
- Q.4** Attempt **ANY TWO** of the following: **(12)**
- a) Define:
    - i) Molality
    - ii) Normality
    - iii) Parts per thousand
    - iv) Parts per million
  - b) What is a titration curve? Explain the titration curve of strong base and weak acid. Which indicator will you choose for this titration? Why?
  - c) Write a note on complexometric titration.
- Q.5** Attempt **ANY FOUR** of the following: **(12)**
- a) How will you calibrate a burette?
  - b) Explain Iodometry with suitable example.
  - c) What are mixed indicators? Give the preparation of any one mixed indicator.
  - d) How many ml of 0.5 N HCl should be added to neutralize 25ml of 0.25 N NaOH solution?
  - e) What volume of water should be added to 100 ml of 0.250 N reagent to prepare exactly 0.125N 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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