BACHELOR OF SCIENCE (CBCS-2018 COURSE)
F. Y. B. Sc. Sem-I :SUMMER- 2022
SUBJECT : CHEMISTRY : PHYSICAL & INORGANIC CHEMISTRY-I

Day : Thursday   Time : 11:00 AM-02:00 PM
Date : 7/7/2022   **S-18295-2022**   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.
3) Draw neat and labelled diagrams wherever necessary.
4) Use of **log table/ scientific calculator** is allowed.

SECTION-I (Physical Chemistry)

Q.1   Attempt any **TWO** of the following: **(12)**

a)   Obtain the equation of velocity constant for the second order reaction when $a = b$.

b)   Deduce partition law thermodynamically.

c)   What is slope? How is it determined?

Q.2   Attempt any **TWO** of the following: **(12)**

a)   Discuss the process of extraction with respect to distribution law.

b)   Give brief account of order of the reaction.

c)   Explain properties of third order reaction.

Q.3   Attempt any **THREE** of the following: **(12)**

a)   Describe the factors affecting rate of the reaction.

b)   If $y = x^2 (x^3 - 1)$, $\dfrac{dy}{dx} = ?$

c)   Evaluate $\int \left[\dfrac{1}{x^3} - \dfrac{1}{\sqrt{x}} + 8x^4 \right] dx$

d)   In a certain unimolecular reaction, the time for half change was 128.5 minutes. Find the velocity constant.

SECTION-II (Inorganic Chemistry)

Q.4   Attempt any **TWO** of the following: **(12)**

a)   Define and write the formula for each of the following terms:
i) Parts per million (ppm) and parts per billion (ppb)
ii) Volume percent.
iii) Mole Fraction.

b)   What do you mean by a standard solution? Also explain primary and secondary standard substances with suitable examples.

c)   Find the amount of the substance to be weighed to prepare following solutions:
i) 500 ml 0.05 N solution of $FeSO_4$ (eq. wt. of $FeSO_4 = 278$)
ii) 100 ml 0.025N solution of $KMnO_4$ (eq. wt. of $KMnO_4 = 31.6$)

Q.5   Attempt any **FOUR** of the following: **(12)**

a)   Explain the terms:
i) Reduction   ii) Oxidizing agent

b)   Calculate oxidation number of
i) 'S' in H_2SO_4 ii) 'Cr' in $K_2Cr_2O_7$

c)   What is the volume of 0.2N solution of NaOH required to neutralize 8ml of 0.05N H_2SO_4 solution?

d)   What is normal solution? How will you prepare 1N solution of oxalic acid? (eq. wt = 63)

e)   If the strength of HCl solution is 1.825 g per lit and equivalent weight of HCl is 36.5 then what is its normality?

f)   What do you mean by molarity and molality of the solution?

*   *   *   *