

F.Y.B.Sc. SEM – I (CBCS 2018 COURSE) : SUMMER - 2019
SUBJECT – CHEMISTRY : PHYSICAL AND INORGANIC CHEMISTRY – I

Day : Monday
Date : 08/04/2019

S-2019-0767

Time : 03.00 PM TO 06.00 PM
Max. Marks : 60

N.B.

- 1) All questions are **COMPULSORY**.
- 2) Figures to the **RIGHT** indicate **FULL** marks.
- 3) Use of **log table / scientific calculator** is allowed.
- 4) Answer 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) Obtain the equation for velocity constant of the first order reaction.
- b) What are the limitations of the distribution law?
- c) What is slope? How is it determined?

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

- a) Explain the factors affecting the rate of reaction.
- b) State and explain the Nernst distribution law.
- c) 'If one of the reactant in a bimolecular reaction is taken in large excess the reaction becomes of the first order.' Prove.

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

- a) Show that for a first order reaction, the half change time is independent of the initial concentration of the reaction.
- b) If $y = \frac{x^2}{x+2}$, $\frac{dy}{dx} = ?$
- c) The solubility of iodine in water at 24°C is 0.34 g/lit. Calculate the solubility of iodine in CCl₄ if distribution coefficient of iodine in water and CCl₄ is 1.14×10^{-2} .
- d) Evaluate $\int \left[\frac{1}{x^3} - \frac{1}{\sqrt{x}} + 8x^4 \right] dx$.

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) Composition by Mass percent
 - ii) Weight to volume percent
 - iii) Volume percent
- b) Calculate oxidation number of
 - i) P in Ca₃(PO₄)₂
 - ii) S in H₂SO₄
 - iii) B in H₃BO₃
- c) What will be the volume of the solution having following normalities and containing following weights of substances?
 - i) 0.1 N solution containing 2.45 g of K₂Cr₂O₇ (equivalent weight = 49)
 - ii) 0.05 N solution containing 3.1 g of Na₂S₂O₃.5H₂O (equivalent weight = 248)

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

- a) Define Normal solution. How will you prepare 1 N solution of oxalic acid?
- b) If the strength of HCl solution is 1.825 g per lit. and the equivalent weight of HCl is 36.5 then what is its normality?
- c) Calculate oxidation number of S in Na₂S₂O₃ and Mn in KMnO₄.
- d) Explain the terms i) oxidation and ii) reducing agent.
- e) What do you mean by Basicity of the acid and Acidity of the base?
- f) Find the amount of the KMnO₄ to be weighed to prepare 100 ml 0.025 N solution of KMnO₄. (equivalent weight = 31.6)

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