F.Y.B.SC. SEM – I (CBCS - 2016 Course) : WINTER - 2018

SUBJECT : CHEMISTRY : PHYSICAL & INORGANIC CHEMISTRY – I

Day : Wednesday
Date : 10/10/2018

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

W-2018-0679

N.B.:

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

SECTION – I

Q.1 A) Select the most correct alternative from among those given below: **[06]**

a) The values along x – axis are called _____.
i) ordinate **ii)** abscissa **iii)** coordinates **iv)** none of these

b) Liquids which are completely soluble into each other are called _____ liquids.
i) immiscible **ii)** heterogeneous **iii)** miscible **iv)** all of these

c) If $y = k$ then, $\frac{dy}{dx} = ?$
i) 0 **ii)** 1 **iii)** -1 **iv)** ∞

d) ppm and ppb are convenient units to express concentration when _____.
i) solute is present in major quantities.
ii) solute is present in trace quantities.
iii) solute is present in excess quantities.
iv) solute is present in normal quantities.

e) The process of conversion Ca to Ca^{+2} is called _____.
i) addition **ii)** reduction **iii)** oxidation **iv)** dissociation

f) For a Monobasic acid, _____
i) normality = molarity × acidity **iii)** normality = molarity × 2
ii) normality = molarity **iv)** normality = molarity × basicity

B) Answer the following in brief: **[06]**

a) The rate of the first order reaction is directly proportional to .....of a reactant.

b) Give the expression of Nernst's distribution law.

c) What is chemical kinetics?

d) Slope of the line parallel to x-axis is .....

e) What is third order reaction?

f) What are the ionic reactions?

Q.2 Attempt **ANY THREE** of the following: **[12]**

a) Explain the process of extraction.

b) Derive an expression for the velocity constant of second order reaction when a = b.

c) Give examples of the third order reaction.

d) What are the shortcomings of the distribution law?

P.T.O.

Q.3 Solve **ANY FOUR** of the following: **[12]**

a) If $y = x^3 - 5x + 3$, $\frac{dy}{dx} = ?$ find $\frac{dy}{dx}$.

b) If $y = (x^2 - 2)(x + 2)$, $\frac{dy}{dx} = ?$

c) Evaluate $\int x^{1/4}\, dx$.

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

e) Succinic acid has normal molecular condition in water and ether. When different amounts of acid were shaken with ether – water mixture, the following results were obtained :

C_{water} :	25.4	33.3	42.7
C_{ether} :	4.2	5.5	7.1

Calculate the partition coefficient.

Q.4 A) Solve **ANY ONE** of the following: **[06]**

a) Explain the factors affecting the rate of the reaction.

b) Discuss the modifications of the distribution law.

SECTION – II

Q.4 B) Attempt **ANY ONE** of the following: **[06]**

a) Find the amount of the substance to be weighted to prepare following solutions:

i) 100 ml 0.025N solution of $KMnO_4$

ii) 250 ml 0.05N solution of $Na_2S_2O_3$

b) Explain following terms:

i) Oxidation

ii) Stoichiometry

iii) Oxidation number

Q.5 Attempt **ANY TWO** of the following: **[12]**

a) What do you mean by standardization of a solution? Explain primary and secondary standard substances with suitable example.

b) Calculate oxidation state of:

i) 'C' in $(C_2O_4)^{-2}$

ii) 'P' in H_3PO_3

iii) 'Fe' in $FeSO_4$

c) Using normality equation, calculate the volume of 0.2N solution of NaOH required to neutralize 8 ml of 0.05N H_2SO_4 solution.

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