F.Y.B.SC. SEM – I (CBCS - 2016 Course) : SUMMER - 2019

SUBJECT : CHEMISTRY : PHYSICAL & INORGANIC CHEMISTRY – I

Day : Wednesday
Date : 10/04/2019

S-2019-0797

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 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 equation of x – axis is _____.
i) x = 0 **ii)** y = 0 **iii)** x = k **iv)** y = k

b) Integration of dx is _____.
i) x **ii)** x + C **iii)** x – C **iv)** C

c) The derivative of constant is _____.
i) constant **ii)** zero **iii)** 1 **iv)** ∞

d) The correct value of Avogadro's Number (N) is _____.
i) 6.023×10^{23} **ii)** 12.1×23^{10} **iii)** 2.66×10^{-23} **iv)** 22400

e) The process of conversion of Fe^{+2} to Fe^{+3} ions is called as _____.
i) reduction **ii)** oxidation **iii)** ionization **iv)** addition

f) When concentration of a solution is expressed in ppm, it means 1 part in,
i) 10^3 parts of solution **iii)** 10^9 parts of solution
ii) 10^6 parts of solution **iv)** 10^{12} parts of solution

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

a) What is slope?

b) Write the expression for velocity constant of a second order reaction when $a \neq b$.

c) What are ionic reactions?

d) If equation of a straight line is y = mx then x and y are ..... functions.

e) $2NO\ (g) + O_2\ (g) \rightarrow 2NO_2\ (g)$, is an example of ..... order reaction.

f) Slope of the line parallel to x – axis.

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

a) What are the limitations of the distribution law?

b) Distinguish between order and molecularity of the reaction.

c) Explain pseudo – unimolecular reaction with suitable example.

d) Draw straight lines having equations y = mx + c and y = mx – c.

P.T.O.

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

a) If $y=\left(x^2-2\right)\left(x+2\right)$, find $\frac{dy}{dx}$.

b) If $y=x^4-5x+3$, $\frac{dy}{dx}=?$

c) Integrate $\int 4x^{2/3}dx$.

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

e) The solubility of iodine in water at 24^0C is 0.34 g/lit. Calculate the solubility of iodine in CCl_4 if distribution coefficient of iodine in water and CCl_4 is 1.14×10^{-2}.

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

a) Derive an expression for velocity constant of the first order reaction.

b) 'If one of the reactant in a bimolecular reaction is taken in large excess then reaction becomes kinetically of the first order'. Prove.

SECTION – II

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

a) Define following terms with suitable examples:
- **i)** Oxidation number
- **ii)** Oxidation
- **iii)** Reducing agent

b) The strength of sodium carbonate solution is 2.12 g/lit. if the equivalent weight of Na_2CO_3 is 53, what is its normality?

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

a) What do you mean by a 'standard solution'? Explain primary and secondary standard substances with suitable examples.

b) Calculate oxidation state of :
- **i)** 'Cr' in K_2CrO_4
- **ii)** 'S' in $Na_2S_2O_3$
- **iii)** 'N' in HNO_3

c) Define following terms:
- **i)** Stoichiometry
- **ii)** Weight to volume percent
- **iii)** Molecular weight

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