Progressive Education Society's

**Modern College of Arts, Science & Commerce, Ganeshkhind, Pune – 16 (Autonomous)**

**End Semester Examination: MAR / APR 2025**

***Total No. of Questions**: 5 / 17* ***Total No. of Pages**:02*

# FIRST YEAR (NEP Version II)
# COURSE CODE: 24CHE12101
# COURSE NAME: General Chemistry
# (Semester II)

**Program: B.Sc. General** **Credits: 2**
**Program Specific: F.Y.B.Sc.** **Time: 2 Hours**
**Course Type: MAJOR** **Max. Marks: 30**
**Paper: I** **SET: A**

***Instructions to the candidate:***

1) *All questions are compulsory.*
2) *Figures to the right indicate full marks.*
3) *Draw a well labelled diagram wherever necessary.*

**Q1)** Attempt **ANY SIX** of the following: **[6 x 2 = 12]**

1. Write the number of significant figures in (i) 0.0056030 (ii) $3.3012 \times 10^{12}$.
2. Calculate number of moles and millimoles in 12 g of oxalic acid, whose molar mass is 126.07 g $mol^{-1}$.
3. Give the formula to calculate molarity and normality.
4. Define oxidation and reducing agent.
5. Calculate oxidation number of Cl in $KClO_3$ compound.
6. State the rules used for balancing excess O and excess H, in acidic medium, according to ion electron method.
7. Give any two functions of vacuoles.
8. Name the types of carbohydrates.

**Q2**) Attempt **ANY THREE** of the following: **[3 x 4 = 12]**

i. An organic compound on analysis gave 58.55% Carbon, 4.05% Hydrogen, 11.36% Nitrogen and 26.04 % Oxygen. Calculate its empirical formula and molecular formula if its molar mass is 123 g $mol^{-1}$. [Given: Molar mass of: H =1 g $mol^{-1}$, O = 16 g $mol^{-1}$, N = 14 g $mol^{-1}$, C = 12 g $mol^{-1}$]

ii. Calculate the mass of $AgNO_3$ needed to convert 2.33 g of $Na_2CO_3$ to $Ag_2CO_3$. Also calculate the mass of $Ag_2CO_3$ formed.
[Given: Molar mass of : $Ag_2CO_3$ = 275.7 g $mol^{-1}$, $Na_2CO_3$ = 106.0 g $mol^{-1}$, $AgNO_3$ = 169.9 g $mol^{-1}$]

iii. Balance the following reaction by oxidation number method.

$KMnO_4 + HCl \rightarrow KCl + MnCl_2 + Cl_2 + H_2O$

iv. Explain the different types of plastids.

v. Give four differences between nucleosides and nucleotides.

**Q3)** Attempt **ANY TWO** of the following: **[2 x 3 = 06]**

a) Calculate molar concentration of 37 % (w/w) of concentrated hydrochloric acid with density of 1.18 g/mL. [Given: Molar mass of HCl = 36.5 g $mol^{-1}$ ]

b) Balance the following reaction by the ion -electron method.

$Cr_2O_7^{2-} + H^+ + Fe^{2+} \rightarrow Cr^{3+} + Fe^{3+} + H_2O$

c) Balance the following reaction by ion -electron method.

$ClO_2 + SbO_2^- + OH^- \rightarrow ClO_2^- + Sb(OH)_6^-$

d) Give the one function each of lysosomes, cell wall and mitochondria.

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