

I PUC MID-TERM EXAMINATION, SEPT./OCT. - 2026

SUBJECT : CHEMISTRY (34)

Time : 3 Hours

Max Marks : 70

PART-A

I Select the correct option from the given choices.

15x1=15

- 1) Which one of the following represents smallest quantity ?
a) 1850 ng b) 1.85×10^{-4} g c) 1.85×10^3 μ g d) 1.86×10^{-6} Kg
- 2) Which of the following has maximum number of molecules ?
a) 7g N₂ b) 2g H₂ c) 16g NO₂ d) 16g O₂
- 3) The number of neutrons present in ⁸⁰₃₅Br is
a) 80 b) 35 c) 45 d) 115
- 4) The name of the experiment used to determine the charge of the electron is
a) Rutherford α -ray Scattering experiment b) Millikan oil drop experiment
c) Discharge tube experiment d) None of these
- 5) Match column I with column II and mark the appropriate choice

Column I

- A) Phosphorous (Z = 15)
B) Chromium (Z = 24)
C) Iron (Z = 26)
D) Silicon (Z = 14)

Column II

- i) 6 unpaired e⁻
ii) 2 unpaired e⁻
iii) 3 unpaired e⁻
iv) 4 unpaired e⁻

- a) A $\rightarrow$ (iv), B $\rightarrow$ (ii), C $\rightarrow$ (i), D $\rightarrow$ (iii)
b) A $\rightarrow$ (i), B $\rightarrow$ (iii), C $\rightarrow$ (ii), D $\rightarrow$ (iv)
c) A $\rightarrow$ (ii), B $\rightarrow$ (i), C $\rightarrow$ (iii), D $\rightarrow$ (iv)
d) A $\rightarrow$ (iii), B $\rightarrow$ (i), C $\rightarrow$ (iv), D $\rightarrow$ (ii)
- 6) The minimum amount of energy required to eject an electron from the metal surface is called
a) Photo Electric Effect b) Threshold frequency c) Work function d) Quantum
 - 7) The total number of orbitals in a shell with principal quantum number n is
a) 2n b) 2n² c) n² d) n+1
 - 8) The uncertainty principle is significant only for
a) Microscopic object b) Macroscopic object c) both (a) and (b) d) None of these
 - 9) Ionisation Enthalpy is always
a) Negative b) Positive c) Zero d) both (a) and (b)
 - 10) Octet rule is not applicable in
a) BCl₃ b) NO c) PF₅ d) All of these
 - 11) Dipole moment in Debye of H₂O, BF₃ & BeF₂ respectively are
a) 1.85, 0, 0 b) 0, 1.85, 0 c) 0, 0, 1.85 d) 1.85, 1.85, 0
 - 12) Propanone and Propanal are
a) Chain isomers b) Position isomers c) Functional isomers d) Not isomers
 - 13) The relative adsorption of each component of the mixture in adsorption chromatography is expressed in terms of
a) Retardation factor (R_f value) b) Vant Hoff factor
c) both (a) and (b) d) None of these

(P.T.O.)

- 14) The carbocation $^{\oplus}\text{CH}_3$ is
a) Sp^2 hybridised & triangular planar b) Sp hybridised & linear
c) Sp^3 hybridised & tetrahedral d) None of these
- 15) Halogen present in the organic compound is estimated by
a) Dumas method b) Kjeldahl's method c) Carius method d) both (a) & (b)

II Fill in the blanks by choosing the appropriate word from those given in the brackets

5x1=5

(nucleons, Na_2O , Cl_2O_7 , Octahedral, Seven, Cyclo alkanes)

- 16) The SI system has _____ base units.
17) Protons & neutrons present in the nucleus are collectively known as _____.
18) The example for most acidic oxide is _____.
19) The geometry of SF_6 molecule is _____.
20) _____ are saturated cyclic compounds.

PART-B

III Answer any FIVE of the following. Each question carries TWO marks

5x2=10

- 21) State Gay Lussac's law of gaseous volumes.
22) What is the difference between molar mass and molecular mass ?
23) What are isobars ? Give an example.
24) State Pauli's Exclusion principle.
25) Noble gases have large positive electron gain enthalpies. Why ?
26) The first ionisation enthalpy of Nitrogen is more than that of Oxygen. Give reason.
27) Write the Lewis symbols of a) CO_3^{2-} b) O_2
28) What are the factors which determine the partial covalent character of the ionic bond ?
29) Explain Electromeric Effect with an example.
30) How do you prepare Sodium Fusion Extract ? (Lassaigne's Extract)

PART-C

IV Answer any THREE of the following. Each question carries THREE marks.

3x3=9

- 31) Define Electronegativity. How does it vary across the period and down the group ?
32) a) State Modern Periodic law. (2)
b) Give the IUPAC name of element with atomic number 115. (1)
33) Calculate the formal charge on each oxygen atom in Ozone.
34) Give the three main postulates of VSEPR theory.
35) Predict the shape of the following molecules based on VSEPR theory.
(i) BeCl_2 (ii) BF_3 (iii) NH_3

V Answer any THREE of the following. Each question carries THREE marks.

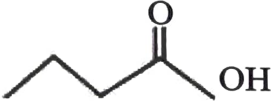
3x3=9

- 36) a) How many significant figures are present in
(i) 0.0025 (ii) 5005
b) Round upto three significant figures 280.8
37) Give the postulates of Dalton's atomic theory.
38) What is Black body radiation ? Give an example of a substance fairly close to black body.
39) Give three differences between Orbit & Orbital.
40) Explain the significance of any three quantum-numbers.

PART-D

VI Answer any TWO of the following. Each question carries FIVE marks.

2x5=10

- 41) a) How do you detect the presence of Nitrogen in an organic compounds. (3)
 b) Mention any two methods of purification of organic compounds. (2)
- 42) For a compound $\text{CH}_2 = \text{CH} - \text{CH}_2 - \text{CH}_3$
 1) Calculate the number of σ & π bonds. (2)
 2) Identify the type of hybridisation of each carbon atom. (2)
 3) Write the bond line formula of the compound. (1)
- 43) a) Write the IUPAC name of the following
 (i)  OH (ii) $\text{ClCH}_2\text{CH}_2\text{OH}$ (2)
- b) Give any three differences between Inductive effect & Resonance effect (3)

PART-E (Numerical Problems)

VII Answer any THREE of the following. Each question carries FOUR marks.

3x4=12

- 44) A organic compound contains 26.66% carbon, 2.22% Hydrogen and 71.12% Oxygen. The molecular mass of the compound is 90. Find the molecular formula.
 [Atomic mass of C = 12u, H = 1u, O = 16u]
- 45) Calculate the wavelength of first line in Balmer series of hydrogen spectrum.
 (Given : $R_H = 1.09677 \times 10^7 \text{ m}^{-1}$)
- 46) Calculate the energy of one mole of photon of radiation whose frequency is $5 \times 10^{14} \text{ Hz}$.
 (Given : $h = 6.626 \times 10^{-34} \text{ Js}$)
- 47) In Carius method of estimation of Bromine 0.15g of organic compound gave 0.12 g of AgBr. Find out the percentage of Bromine in the organic compound.
 [Atomic number of Br = 80 and Molar mass of AgBr Silver bromide = 188 g mol^{-1}]
- 48) Naturally occurring chlorine consists of two isotopes with atomic mass 34.9 & 36.9 and their abundance 75.6% & 24.4 % respectively. Calculate the relative atomic mass of chlorine.
