

# A COMMON QUARTERLY EXAMINATION - 2023

Standard - XI  
CHEMISTRY

Reg.No.

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Marks: 70

Time: 3.00 hrs.

## PART - I

### I. Choose the most appropriate answer:

15×1=15

- Which of the following compound has / have percentage of Carbon same as that in ethylene (C<sub>2</sub>H<sub>4</sub>)  
 a) Propene                      b) ethyne                      c) benzene                      d) ethane
- The number of water molecules in a drop of water weighing 0.018g is  
 a)  $6.022 \times 10^{26}$     b)  $6.022 \times 10^{23}$     c)  $6.022 \times 10^{20}$     d)  $9.9 \times 10^{22}$
- Which of the following d-orbital is clover leaf shaped?  
 a) 3d<sub>xy</sub>                      b) 3d<sub>x<sup>2</sup>-y<sup>2</sup></sub>                      c) 3d<sub>z<sup>2</sup></sub>                      d) both (a) and (b)
- The maximum number of electrons in a subshell is given by the expression  
 a) 2n<sup>2</sup>                      b) 2ℓ+1                      c) 4ℓ+2                      d) none of these
- In a given shell the order of screening effect is  
 a) s > p > d > f    b) s > p > f > d    c) f > d > p > s    d) f > p > s > d
- The IUPAC name for an element with atomic number 222 is  
 a) bibibium                      b) bididium                      c) didibium                      d) bibibium
- Tritium nucleus contains,  
 a) 1p + 0n                      b) 2p + 1n                      c) 1p + 2n                      d) None of these
- Water is a \_\_\_\_\_.  
 a) basic oxide                      b) acidic oxide                      c) amphoteric oxide                      d) none of these
- Maximum deviation from ideal gas is expected from \_\_\_\_\_.  
 a) CH<sub>4(g)</sub>                      b) NH<sub>3(g)</sub>                      c) H<sub>2(g)</sub>                      d) N<sub>2(g)</sub>
- Inversion temperature, T<sub>i</sub> = \_\_\_\_\_.  
 a) 3b                      b)  $\frac{8a}{27Rb}$                       c)  $\frac{2a}{Rb}$                       d)  $\frac{a}{27b^2}$
- In an adiabatic process, which of the following is true?  
 a) q = w                      b) q = 0                      c) ΔE = q                      d) PΔV = 0
- Solubility of carbon dioxide gas in cold water can be increased by  
 a) increase in pressure                      b) decrease in pressure  
 c) increase in volume                      d) none of these
- The IUPAC name of the compound CH<sub>3</sub> - CH = CH - C ≡ CH is,  
 a) pent - 4 - yn - 2 - ene                      b) pent - 3 - en - 1 - yne  
 c) pent - 2 - en - 4 yne                      d) pent - 1 - yn - 3 - ene
- The isomer of ethanol is \_\_\_\_\_.  
 a) acetaldehyde                      b) dimethyl ether                      c) acetone                      d) methyl carbinol
- I effect is shown by  
 a) -Cl                      b) -Br                      c) both (a) and (b)                      d) -CH<sub>3</sub>

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## PART - II

II. Answer any six questions. Question No.24 is compulsory.

6×2=12

16. Define mole?
17. How many orbitals are possible for  $n = 4$ ?
18. State Aufbau's principle?
19. Ionisation potential of N is greater than that of O. Why?
20. State Gay - Lussac's law?
21. What is Lattice energy?
22. Write a balanced chemical equation for the equilibrium reaction for which the

equilibrium constant is given by  $K_C = \frac{[\text{NH}_3]^4 [\text{O}_2]^5}{[\text{NO}]^4 [\text{H}_2\text{O}]^6}$

23. What is homologous series?
24. Calculate the molar mass of the following compounds.
  - i) Urea  $[\text{CO}(\text{NH}_2)_2]$
  - ii) ethanol  $[\text{C}_2\text{H}_5\text{OH}]$

## PART - III

III. Answer any six questions. Question No.33 is compulsory:

6×3=18

25. Distinguish between oxidation and reduction.
26. State Heisenberg's uncertainty principle.
27. What is diagonal relationship. Give an example.
28. Write the uses of heavy water.
29. State the Dalton's law of partial pressure.
30. List the characteristics of internal energy.
31. State Le-Chatelier's principle.
32. Explain inductive effect with an example.
33. Write the IUPAC name for the following compounds.
  - i)  $\text{CH}_3 - \text{CH}_2 - \text{COOH}$
  - ii)  $\text{CH}_3 - \text{O} - \text{GH} - \text{CH}_3$
  - iii)  $\text{CH}_3 - \text{CHO}$

$$\begin{array}{c} | \\ \text{CH}_3 \end{array}$$

## PART - IV

IV. Answer all the questions:

5×5=25

34. a) An organic compound present in Vinegar has 40% Carbon, 6.6% hydrogen and 53.4% Oxygen. Find the empirical formula of the compound. (OR)
- b) Define the following terms.
  - i) Relative atomic mass
  - ii) Avogadro number
  - iii) Molar mass
35. a) Derive de-Broglie equation. (OR)
- b) Explain the Pauling method for the determination of ionic radius.
36. a) i) How do you convert parahydrogen into ortho hydrogen.
- ii) What are the types of hydrogen bonding. Give an example for each. (OR)
- b) Derive the values of critical constants in terms of Vander Waals Constants.
37. a) State the various statements of second law of thermodynamics. (OR)
- b) Derive the relation between  $K_p$  and  $K_C$ .
38. a) Explain the classification of organic compounds based on the structure. (OR)
- b) i) What is called Resonance?
- ii) Write the differences between electrophiles and nucleophiles.