

# HIGHER SECONDARY FIRST YEAR CHEMISTRY

## QUARTERLY EXAM SEPTEMBER -2022 -IMPORTANT QUESTIONS

### LESSONS 1,2,3,4,6,7,8,11,12

#### 1. BASIC CONCEPTS OF CHEMISTRY AND CHEMICAL CALCULATIONS

2 & 3 MARKS	PAGE NO	IMPORTANCE
1. What do you understand by the term mole?	6	1*
2. Define Avogadro number	7	3*
3. What is Molar Mass?	8	1*
4. Define Molar volume	8	1*
5. Define Gram equivalent mass	8	1*
6. What are limiting agent and excess agent?	17	1*
7. Define redox reaction. Give an example	19	1*
8. What is oxidation number?	20	3*

5 MARKS	PAGE NO	IMPORTANCE
1. What is oxidation and reduction?		1*
2. What are the rules to find oxidation number?		1*

#### 2. QUANTUM MECHANICAL MODEL OF ATOM

2 & 3 MARKS	PAGE NO	IMPORTANCE
1. What did Rutherford's alpha ray scattering experiment ?	39	1*
2. What are the defects of Rutherford's model?	39	1*
3. What is Zeeman effect?	40	1*
4. What is Stark effect?	40	1*
5. Write note on limitations of Bohr's model of an atom	40	
6. State Heisenberg's uncertainty principle	42	5*
7. What are quantum numbers?	44	3*
8. Define Principal quantum number	45	1*
9. Define Azimuthal quantum number	45	3*
10. Define Magnetic quantum number, spin quantum number	46	1*
11. Define orbital	46	3*
12. Which has the stable electronic configuration? Ni <sup>2+</sup> , Fe <sup>3+</sup>	57	1*
13. How many orbitals are possible for n = 4?	46	1*
14. State and explain Pauli's exclusion principle	52	5*
15. State Hund's rule	53	5*
16. State n+l rule (aufbau principle)	51	5*
17. Define exchange energy	56	1*

5 MARKS	PAGE NO	IMPORTANCE
1. Enlist the postulates of Bohr's model of an atom	39	3*
2. Derive an equation for the wavelength of a matter wave (de Broglie eq)	40,41	5*
3. Describe the Aufbau principle	52	1*

#### 3. PERIODIC CLASSIFICATION OF ELEMENTS

2 & 3 MARKS	PAGE NO	IMPORTANCE
1. What is periodic law?	70	3*
2. What is modern periodic law?	73	1*

3. Mention anomalous properties of second period elements	89	1*
4. What are atomic and ionic radius?	79,83	1*
5. What is covalent radius?	79	1*
6. Why is covalent radius shorter than the actual atomic radius?	79	
7. What is metallic radius?	80	1*
8. What is screening effect or shielding effect?	80	1*
9. What is effective nuclear charge?	80	1*
10. State Slater rule	80	
11. Define Ionization enthalpy or ionization energy	84	1*
12. Define electro negativity	87	
13. Briefly give the basis for Pauling's scale of electro negativity	87	

5 MARKS	PAGE NO	IMPORTANCE
1. Explain the Pauling method for the determination of ionic radius	83	3*
2. Explain the periodic trend of ionization potential	85	5*
3. State the trends in the variation of electro negativity in group and periods	87,88	5*

#### 4. HYDROGEN

2 & 3 MARKS	PAGE NO	IMPORTANCE
1. What are the similarities of Hydrogen and alkali metals?	101	1*
2. Justify the position of hydrogen in the periodic table	101	1*
3. What are isotopes? Write the names of isotopes of hydrogen	101	1*
4. What are ortho and para hydrogen?	102	3*
5. How will you convert para hydrogen into ortho hydrogen?	102	3*
6. How is hydrogen obtained by electrolysis?	103	
7. How is water gas or syngas produced?	103	1*
8. What is water gas shift reaction?	103	
9. Explain the exchange reactions of deuterium	105	
10. Mention the uses of deuterium	111	3*
11. What are soft water and hard water?	108,109	1*
12. How will you remove temporary hardness of water?	109	3*
13. How is hardness removed by Clark's method?	109	1*
14. Heavy water a monobasic acid. Give reason	111	1*
15. An ice cube at 0° C is placed in some liquid water at 0° C, the ice cube sinks- why?	114	
16. Hard water produces less foam with detergents. Why ?	110	1*
17. Mention the uses of heavy water	111	1*
18. Discuss three type of covalent hydrides	113	3*
19. Why interstitial hydrides have a lower density than the parent metal?	113	1*
20. How do you expect the metallic hydrides to be useful for hydrogen storage?	113	

5 MARKS	PAGE NO	IMPORTANCE
1. Explain the removal of permanent hardness of water	109	3*

#### 6. GASEOUS STATE

2 & 3 MARKS	PAGE NO	IMPORTANCE
1. State Boyle's law	160	1*
2. What is the consequence of Boyle's law?	161	1*

3. What is Charles law?	162	1*
4. Define absolute zero or Kelvin scale	164	
5. State Avogadro's hypothesis	165	1*
6. What is Gay Lusaac law?	164	1*
7. What are ideal gases? In what way real gases differ from ideal gases?	165	1*
8. Write note on Dalton's law of partial pressure	166	3*
9. Write note on Graham's law of diffusion	167	
10. Distinguish between diffusion and effusion	168	5*

### 7. THERMODYNAMICS

2 & 3 MARKS	PAGE NO	IMPORTANCE
1. What are system, surrounding, boundary?	188	1*
2. What are the types of systems depending on the nature of the boundary?	188	1*
3. Explain intensive properties with two examples	189	1*
4. Explain extensive properties with two examples	189	1*
5. What are reversible, irreversible process?	189	1*
6. Define adiabatic process	190	1*
7. Define isobaric process	190	1*
8. Define isochoric process	190	1*
9. Define isothermal process	190	1*
10. What is cyclic process?	190	1*
11. What are state and path functions? Give two examples	190,191	1*
12. What is internal energy?	191	
13. State zeroth law of thermodynamics	194	3*
14. State the first law of thermodynamics	195	3*
15. What are the various statements of first law of thermodynamics?	195	3*
16. Define enthalpy	197	
17. Define Hess's law of constant heat summation	207	1*
18. What are the applications of Hess law?	207	
19. Define lattice energy	208	
20. Define entropy. Give its unit	210	1*
21. Give Kelvin statement of second law of thermodynamics	210	1*
22. State Clausius statement of second law of thermodynamics	211	1*
23. What are the criteria for spontaneity of reactions?	212	1*
24. What is standard entropy change?	212	
25. What is standard entropy of formation?	212	
26. Define entropy of fusion	213	
27. Define entropy of vaporization	213	
28. Define entropy of transition	213	
29. State Gibbs free energy	214	3*
30. Derive the relationship between standard free energy change and equilibrium constant	217	1*
31. Define reaction quotient	217	
32. State the third law of thermodynamics	218	3*

5 MARKS	PAGE NO	IMPORTANCE
1. Explain the different cases of various process in the mathematical statement of the first law of thermodynamics	196	3*

2. Derive the relationship between $\Delta H$ and $\Delta U$ for an ideal gas. Explain each term involved in the equation	197	
3. What are the conventions of thermo chemical equations?	198,199	
4. Write down the Born Haber cycle for the formation of sodium chloride	209	3*
5. What are spontaneous reactions? What are the conditions for the spontaneity of a process?	213 215	
6. List the characteristics of Gibbs free energy	215	5*
7. State various statements of second law of thermodynamics	210 211	3*

### 11.FUNDAMENTALS OF ORGANIC CHEMISTRY

2,3 & 5 MARKS	PAGE NO	IMPORTANCE
1. What are the Characteristics of organic compounds	111	1*
2.What is Homologous series	112	
3. Questions from Nomenclature of organic compounds	114 to 128	3*
4. Explain about Isomerism in organic compounds	131 to 134	3*
5. What is Stereoisomerism?	135 to 136	1*
6.Write a note on Optical Isomerism	137	

### 12.BASIC CONCEPTS OF ORGANIC REACTIONS

2,3 & 5 MARKS	PAGE NO	IMPORTANCE
1. What are Nucleophiles and electrophiles?	164	5*
2.What is Inductive effect (I)	166	1*
3. What is Electromeric effect (E)	167	1*
4.What is Resonance or Mesomeric effect	168	1*
5.What are the Different types of organic reactions?	171 to 173	1*

NOTE: 5\* means Very very important question, 3\* means Very important question, 1\* means important question,

**பொறுப்புத்திறப்பு:** மேற்கண்ட வினாக்களின் முக்கியத்துவமானது, இதற்குமுன் நடைபெற்ற தேர்வுகளில் கேட்கப்பட்டதைப் பொறுத்து நிர்ணயிக்கப்பட்டுள்ளது. எனவே இது ஒரு வழிகாட்டி மட்டுமே. இதிலிருந்துதான் திருப்புதல் தேர்வுக்கு வினாக்கள் கேட்கப்படும் என்று உறுதியாக கூற இயலாது. எனவே பாடப்புத்தகத்தை பிரதானமாகக்கொண்டு படிக்க வேண்டும்.

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