

Model Question Paper 2026-27

Subject : Chemistry

Class XI

Time : 3hrs

MM: 60

Note:

- I: There will be 28 questions in all.
a: Q.N 1 to 12 are Multiple choice question and carry 1 Mark each.
b: Q.N 13 to 19 are very short answer questions carrying 2 Marks each.
c: Q.N 20 to 24 are short answer questions carrying 3 Marks each.
d: Q.N 25 is a case study based question and carries 4 Marks.
e: Q.N 26 to 28 are long answer questions carrying 5 Marks.
- II: All Questions are compulsory however internal choices have been given.

SECTION A (MCQs) (1 Mark Each) (12 x 1 = 12)

Q.1. Match the following physical quantities with their Name of SI units :

	Physical Quantity	Symbol for unit
(a)	Amount of substance	Candela
(b)	Thermodynamic temperature	Amphere
(c)	Electric Current	mole
(d)	Luminous intensity	Kelvin

Q.2. Which of the following sets of quantum numbers are not possible:

- | | |
|---------------------------------|---------------------------------|
| (a) $n=0, l=0, m_l=0, m_s=+1/2$ | (b) $n=1, l=0, m_l=0, m_s=+1/2$ |
| (c) $n=2, l=1, m_l=0, m_s=+1/2$ | (d) $n=3, l=0, m_l=0, m_s=+1/2$ |

Q3. Rajeev throw a ball with a speed of 25 m/s. If the mass of ball is 40g . if speed can be measured within accuracy of 2%.The uncertainty in the position is:

- (a) $2.63 \times 10^{33} \text{m}$ (b) $2.50 \times 10^{30} \text{m}$ (c) $2.10 \times 10^{32} \text{m}$ (d) 2.10×10^{28}

Q 4. The repulsive interaction of Electron pairs decrease in the order :

- (a) $lp-lp > lp-bp > bp-bp$ (b) $Bp-bp > lp-lp > lp-bp$ (c) $bp-bp > lp-bp > lp-lp$ (d) $lp-bp > bp-bp > lp-lp$

Q5. A flask is insulated as such from its surrounding by a boundary that prevents exchange of heat but allows the transmission of work. Which type of boundary is it

- (a) Open . (b) Adiabatic (c) isothermal (d) closed

Q6. Which of the following is a strong Acid:

- (i) $\text{H}_2\text{C}_2\text{O}_4$ (ii) CH_3COOH (iii) HClO_4 (iv) HF

Q7. The correct sequence of HCl, HBr, HI and HF as per increasing acidic strength :

- (i) $\text{HF}, \text{HCl}, \text{HI}, \text{HBr}$ (ii) $\text{HCl}, \text{HBr}, \text{HI}, \text{HF}$ (iii) $\text{HF}, \text{HCl}, \text{HBr}, \text{HI}$ (iv) $\text{HI}, \text{HF}, \text{HBr}, \text{HCl}$

Q8. The oxidation no of Cl in HClO_4 is:

- (i) +6 (ii) +5 (iii) +7 (iv) +8

- Q9.** In the following chemical Reaction:
 $2\text{Cu}_2\text{O(s)} + \text{Cu}_2\text{S(s)} \longrightarrow 6\text{Cu(s)} + \text{SO}_2\text{(g)}$ the substance which is oxidised and reduced are:
 (a) Sulphur reduced and Cu^+ is oxidised (b) Sulphur oxidised and Cu^+ is reduced
 (c) Sulphur and Cu^+ are reduced (b) Sulphur and Cu^+ are oxidised
- Q10.** What happens to the value ΔH , when a thermochemical equation is multiplied by a factor of n ?
 (a) ΔH is divided by n (b) ΔH is unaffected
 (c) ΔH is multiplied by n (d) ΔH is raised to the power of n
- Q11.** The order of decreasing priority for some functional groups is:
 (a) $-\text{COOH}$, $-\text{SO}_3\text{H}$, $-\text{COOR}$, $-\text{COCl}$, $-\text{CONH}_2$, $-\text{CN}$, $-\text{HC=O}$, $>\text{C=O}$, $-\text{OH}$, $-\text{NH}_2$, $>\text{C=C<}$, $-\text{C}\equiv\text{C}-$
 (b) $-\text{COOH}$, $>\text{C=C<}$, $-\text{SO}_3\text{H}$, $-\text{COOR}$, $-\text{COCl}$, $-\text{CONH}_2$, $-\text{CN}$, $-\text{HC=O}$, $>\text{C=O}$, $-\text{OH}$, $-\text{NH}_2$, $-\text{C}\equiv\text{C}-$
 (c) $-\text{COOH}$, $-\text{NH}_2$, $-\text{COOR}$, $-\text{SO}_3\text{H}$, $-\text{COCl}$, $-\text{CONH}_2$, $-\text{CN}$, $-\text{HC=O}$, $>\text{C=O}$, $-\text{OH}$, $>\text{C=C<}$, $-\text{C}\equiv\text{C}-$
 (d) $-\text{COOR}$, $-\text{COCl}$, $-\text{CONH}_2$, $-\text{CN}$, $-\text{HC=O}$, $>\text{C=O}$, $-\text{OH}$, $-\text{NH}_2$, $>\text{C=C<}$, $-\text{C}\equiv\text{C}-$, $-\text{COOH}$, SO_3H
- Q12.** The highest boiling point is of:
 (a) iso- butane (b) n-octane (c) 2,2,3,3-tetramethyl butane (d) n-butane

SECTION B (VERY SHORT ANSWERS) (1+1=2 Marks Each) (7 x 2 = 14)

- Q13.** (a) Thomson determine the value of e/m_e as:
 (i) $1.758820 \times 10^{11} \text{ C/kg}$ (ii) $1.756620 \times 10^{10} \text{ C/kg}$
 (iii) $1.748820 \times 10^{11} \text{ C/Kg}$ (iv) $1.758820 \times 10^{10} \text{ C/Kg}$.
 (b) Name the element with symbol whose atomic number (Z) and atomic mass (A) are given below:
 (i) $Z=18$, $A=40$ (ii) $Z=92$, $A=238$
- Q14** (a). Define Hess's law of constant heat summation?
 (b) Calculate the standard enthalpy (ΔH) when carbon is partially oxidized to form carbon monoxide gas:
 $\text{C} + 1/2\text{O}_2 \longrightarrow \text{CO(g)}$ $\Delta_r H^\ominus = ?$ you are given following information:
 $\text{C(graphite, s)} + \text{O}_2\text{(g)} \longrightarrow \text{CO}_2\text{(g)}$ $\Delta_r H^\ominus = -393.5 \text{ kJ mol}^{-1}$
 $\text{CO(g)} + 1/2\text{O}_2\text{(g)} \longrightarrow \text{CO}_2\text{(g)}$ $\Delta_r H^\ominus = -283.5 \text{ kJ mol}^{-1}$
- Q15** (a) **Assertion** : Boron ($Z=5$) has smaller first ionization enthalpy than beryllium ($Z=4$)
 Even it has more nuclear charge.
Reason : The penetration of $2s$ electron to the nucleus is more than that of $2p$ electrons
 hence $2p$ electrons are more shielded from nucleus in case of Boron make them easier to remove.
 (a) Both Assertion and Reason are true & Reason is correct explanation of Assertion.
 (b) Both Assertion and Reason are true & Reason is not correct explanation of Assertion.
 (c) Assertion is true & Reason is False.
 (d) Assertion is false but Reason is true.
 (b) **Assertion**: Electron gain enthalpy of O or F is less negative than that of succeeding Elements (sulphur and chlorine)
Reason: when an electron is added to O or F, the added electron goes to the smaller $n=2$

Quantum level and suffers attraction from other electrons present in this level.

- (a) Both Assertion and Reason are true & Reason is correct explanation of Assertion.
- (b) Both Assertion and Reason are true & Reason is not correct explanation of Assertion.
- (c) Assertion is true & Reason is False.
- (d) Assertion is false but Reason is true.

Q16 (a) Write mathematical expression relating Enthalpy, internal energy, pressure and volume?
(b) Calculate the specific heat capacity (c) of a substance 50 gm of which absorbs 10 J of heat and its temperature rises to 30°C.

Q17 Predict the Entropy change with reasons :
(a) We kept water in a freezer, after some time it converts into ice.
(b) A crystalline solid is heated up to 120°C.

Q18. (a) **Assertion:** When a soda water bottle is opened, some of the carbon dioxide gas dissolved in Soda water fizzes out rapidly.

Reason: Fizzing out of soda water is due to difference in solubility of carbon dioxide at Different pressures.

- (a) Both Assertion and Reason are true & Reason is correct explanation of Assertion.
- (b) Both Assertion and Reason are true & Reason is not correct explanation of Assertion.
- (c) Assertion is true & Reason is False.
- (d) Assertion is false but Reason is true.

(b) **Assertion:** For the hydrolysis of sucrose ($\text{Sucrose} + \text{H}_2\text{O} \rightleftharpoons \text{Glucose} + \text{Fructose}$)
 $\Delta G^0 = -7.4 \times 10^4 \text{ J/mol}$.

Reason: ΔG^0 is negative, then the reaction is considered non-spontaneous and proceeds in forward direction.

- (a) Both Assertion and Reason are true & Reason is correct explanation of Assertion.
- (b) Both Assertion and Reason are true & Reason is not correct explanation of Assertion.
- (c) Assertion is true & Reason is False.
- (d) Assertion is false but Reason is true.

Q19 Give reasons for the following:
(a) Boiling point of methane is 111.0 K, whereas boiling point of pentane is 309.1 K.
(b) Staggered conformation is more stable than the Eclipsed conformation.

SECTION C (Short answer questions) (1+2=3 Marks Each) (5 x 3 = 15)

Q20 (a) A mixture contains two liquids with very close boiling points. Which method will you use to separate them and why?

(b) Draw the structures of following compounds:

(i) 1,3 Dimethylbutane (ii) Hexane-2,4-dione.

Q21 (a) Match the following spectral lines:

Series	Spectral Region
(i) Lyman	infrared
(ii) Balmer	infrared
(iii) Paschen	Visible
(iv) Pfund	Ultraviolet

(b) Calculate the wave number and frequency of violet radiation having wavelength 400nm.

Q22 (a) Define periodicity?

(b) Why radii of O^{2-} , F^- , Na^+ , Mg^{2+} is different whereas all of them have same no of electrons(10)? What such type of species called?

Q23 (a) A student prepared copper nitrate solution in his school chemistry Lab. One of his group mate put a zinc rod in the beaker, after some time the blue colour of the solution disappears. what happens to the solution ? Explain with appropriate chemical equation.

(b) Calculate the oxidation no of B and S in the following species:



Q24 (a). Judge suspected that some changes in the document had been carried out while going through them in a court hearing .He directed the forensic department to check the ink used at 2 different places. According to you , Which technique will be used by department and why?

(b) write a short note on Lassaigne test.

SECTION D(Case Based Questions) (1+1+1+1=4)

Q25. In a practical examination ,student are asked to prepare Acid –base solution on bronsted lowry theory. A student (Akhilesh) simply mixes an aqueous solution of ammonia (NH_3) with an aqueous solution of Hydrochloric acid (HCl). While another student (Sanjeev) mixes an aqueous solution of ammonia (NH_3) with Water(H_2O).Based on their experiments answer the following questions.

(a) Write the chemical reactions in both the cases.

(b) Identify the bronsted –lowry acid and base in the reactants of Akhilesh and sanjeev.

(c) State the conjugate acid –base pairs for the reactions.

(d) Name a species which can act as amphoteric ?

SECTION E (Long Answers Questions) (1+1+1+2= 5) (3 x 5 = 15)

Q26 (a) Define Hybridization?

(b) Predict the hybridization of central atom in SF_6 Molecule?

(c) In NH_3 and H_2O type of hybridization is Sp^3 , Why the Bond angle in NH_3 is 107° while angle in H_2O is 104.5° ?

(d) Explain Sp^2 type of hybridization with example.

OR

According to molecular orbital theory(MOT) ,the atomic orbitals of comparable energies and proper symmetry combine to form molecular orbitals ,electrons are under the influence of two or more nuclei depending upon number of atoms in the molecule . The no of molecular orbitals formed is equal to the no of combining atomic orbitals and results in formation of bonding molecular orbital of lower energy and higher stability and antibonding molecular orbitals of opposite properties. The molecular are filled similar to atomic orbitals in accordance with Aufbau principle ,Pauli exclusion principle and Hund's Rule. several molecules Like He_2 , C_2 , O_2 stability ,Bond order, Nature of bond, Bond length, and Magnetic nature can be explained by the help of this theory.

Answer the following Question :

(a) Who developed MOT?

(b) Write the electronic configuration of C_2 molecule as per MOT?

(c) What is the nature of double bond formed in C_2 molecule ?

(d) What is the bond order and Magnetic behaviour of C_2 molecule?

Q27 (a) Explain law of Multiple proportions with help of an example?

(b) How many significant figures are present in the following?

(i) 802 (ii) 6.002

(c) Calculate the no of molecules in 20g of H_2 ?

(d) A compound contains 1.5 g of Calcium, 1.2g of Carbon and 4.8g of Oxygen. Find the Empirical formula of the compound.

OR

In a chemistry lab a student prepares a solution by dissolving 9.2 g of Ethanol (C_2H_5OH) in 100g of Water. The final volume of the solution is found to be 105 ml. (Molar mass of ethanol = 46g/mol, water = 18g/mol). The student is asked to analyse the composition of the solution using different concentration terms like, molarity, molality, and mole fraction and understand how each depends on volume or mass of solution/solvent. While molarity depends on volume, molality and mole fraction depend only on mass. On the basis of given information answer the following questions:

(a) Which of the concentration term is unit less?

(b) If water partially evaporates, which concentration term change the most?

(c) Calculate the no of moles of Ethanol in the solution?

(d) Calculate the mole fraction of ethanol and water in the solution?

Q28 (a) Define isomerism?

(b) Draw the different isomers of Butene?

(c) Why the boiling point of cis But-2-ene is higher to trans But-2-ene?

(d) Explain with the help of structure, why the trans But-2-ene is Non polar?

OR

A student performs addition reaction of unsymmetrical alkenes with hydrogen halides under different conditions. He observes that the orientation of addition changes depending on the reaction conditions.

Markovnikov's rule states that during the addition of HX (HCl, HBr) to an unsymmetrical alkene, the hydrogen atom attaches to the carbon already having more hydrogen atoms whereas the halide ion goes to more substituted carbon. (stable intermediate).

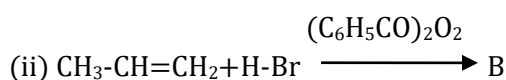
This reaction follows Anti Markovnikov's rule in presence of peroxides.

(a) Define Markovnikov's Rule?

(b) Which intermediate species form during the reaction according to Markovnikov's rule?

(c) Arrange the $1^\circ, 2^\circ, 3^\circ$ carbocations in order of their decreasing stability?

(d) Complete the following reaction:



Name the A and B product.

Chapter wise Marks Distribution and Blueprint of XI Chemistry Paper Session 2026-27

There will be 28 questions in all .

Q.N1 to 12 are Multiple Choice Questions and Carry 1 mark each.

Q.N13 to 19 are Very Short Questions and carry 2 Marks each.

Q.N.20 to 24 are Short Answer Questions and carry 3 Marks each.

Q.N 25 is a Case Study Based Question And carries 4 Marks.

Q.N 2 to 28 Long Answer Questions and carry 3 Marks each.

S.No	Chapter	1 Mark	2 Marks	3 Marks	4 Marks	5 Marks	Total Marks ↓
1	Some Basic Concepts of Chemistry	1				1	6
2	Structure Of Atom	2	1	1			7
3	Classification of elements and periodicity in properties	---	1	1			5
4	Chemical bonding and Molecular properties	2				1	7
5	Chemical Thermodynamics	1	3				7
6	Equilibrium	2	1		1		8
7	Redox Reactions	2		1			5
8	Organic Chemistry: Some Principles and Tecniques	1		2			7
9	Hydrocarbons	1	1			1	8
	Total Questions	12	7	5	1	3	
	Total Marks	12	14	15	4	15	60

FORMAT OF BLUE PRINT SESSION 2026-27

SUBJECT : CHEMISTRY

PAPER : 1

MAX MARKS: 60

CLASS : XI

TIME: 3 HRS

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