

Cbse Class 12



**Sample Question Papers
Chemistry With
Solutions**

**KENDRIYA VIDYALAYA SANGATHAN CHENNAI REGION
COMMON PRE-BOARD EXAMINATION**

CLASS: XII Chemistry

Time allowed: 3 hours]

[Maximum marks: 70

General Instructions:

- (i) All questions are compulsory.
- (ii) Question nos. 1 to 8 are very short answer questions and carry 1 mark each.
- (iii) Question nos. 9 to 18 are short answer questions and carry 2 marks each.
- (iv) Question nos. 19 to 27 are also short answer questions and carry 3 marks each.
- (v) Question nos. 28 to 30 are long answer questions and carry 5 marks each.
- (vi) Use log tables if necessary, use of calculators is not allowed.

- 1 Which point defect in its crystal units increases the density of a solid? 1
- 2 What is meant by an elementary reaction? 1
- 3 Name the two types of adsorption of gases on solids. 1
- 4 What is the role of collectors in Froth Floation process? 1
- 5 What is the IUPAC name of: $[\text{Ag}(\text{NH}_3)_2][\text{Ag}(\text{CN})_2]$. 1
- 6 Draw the structure of 2-Ethoxy -1,1-dimethylcyclohexane. 1
- 7 Arrange the following compounds in an increasing order of their acid strength: 1
Benzoic acid, 4-Nitrobenzoic acid, 4-Methoxybenzoic acid.
- 8 Write any one difference between amylase and amylopectin? 1
- 9 Mixing of acetone and chloroform occurs with reduction in volume and is exothermic 2
process. What change will occur in vapour pressure? Explain your answer.
- 10 Define the following: 2
i)Order of a reaction ii)Activation energy of a reaction
(or)
List two factors on which the rate of a chemical reaction depends.
- 11 For the reaction $A \rightarrow B$, the rate of reaction becomes twenty seven times when the 2
concentration of A is increased three times. What is the order of the reaction?
- 12 Describe the principle involved in each of the following processes: 2
i)Electro refining ii)Mond's process for refining of Nickel
- 13 What are interstitial compounds? Why are such compounds well known for transition 2
metals?
- 14 Draw a figure to show splitting of degenerate d-orbitals in an octahedral field. How 2
does the magnitude of the Δ_o decides the high spin and low spin complexes.
- 15 The treatment of alkyl chlorides with aqueous KOH leads to the formation of 2
alcohols but in the presence of alcoholic KOH, alkenes are major products. Explain.
- 16 How the following conversions can be carried out? 2
i) Chloroethane to butane ii)Isopropyl alcohol to Iodoform
- 17 Give reasons: 2
i) Methylamine is a stronger base than ammonia
ii)Aniline does not undergo Fridel Crafts reaction.
- 18 Write one chemical reaction each to illustrate the following: 2
i)Gabriel Phthalimidesynthesis ii)Hoffmann-Bromamide reaction
- 19 The density of chromium is 7.2 g cm^{-3} . If the unit cell is a cubic with edge length of 3
289 pm, determine the type of the unit cell. (Atomic mass of Cr = 52 u)

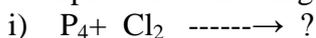
(or)

X-ray diffraction studies show that an element crystallises in an fcc unit cell edge of

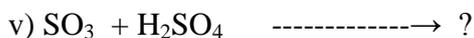
- 3.608 x 10⁻⁸ cm. In a separate experiment, the element is determined to have a density of 8.92 g cm⁻³, calculate the atomic mass of the element.
- 20 Calculate the boiling point of a solution prepared by adding 15.0 g of NaCl to 250.0 g of water. (K_b for water = 0.512 K kg mol⁻¹, Molar mass of NaCl = 58.44 g, Assume NaCl undergoes complete dissociation) 3
- 21 A colloidal solution of AgI is prepared by two different methods that is 3
 i) By adding AgNO₃ to KI solution (excess)
 ii) By adding KI to AgNO₃ solution (excess).
 What is the charge acquired by the colloid formed in both the cases. Explain your answer.
- 22 Draw the structure of i) H₃PO₄ ii) HClO₃ iii) XeF₄. 3
- 23 Write chemical equations for the reactions involved in the manufacture of potassium dichromate from iron chromite ore. 3
- 24 An organic compound A having molecular formula C₆H₆O gives a violet colour with neutral FeCl₃ solution. A on treatment with CO₂ and NaOH at 400 K under pressure gives B which on acidification gives a compound C. The compound C reacts with acetyl chloride to give D which is a popular pain killer. Deduce the structure of A, B, C and D. 3
- 25 Explain what is meant by 3
 (i) a peptide linkage (ii) a glycosidic linkage (iii) a nucleotide
- 26 What are biodegradable polymers? Give two examples. 3
- 27 Akash observed that his friend Srihari was showing a change in behaviour from past couple of weeks. Srihari stayed aloof, did not play and mingle with friends and became easily irritable. He avoided going in any functions and parties. Akash shares his concerns with his class teacher. The teacher called Srihari and advised him to consult a doctor. Doctor prescribes antidepressant drugs for him. After two months Srihari was diagnosed to be normal.
 i) Mention the values shown by Akash and Teacher. 1
 ii) Name one antidepressant drug. 1
 iii) How should Srihari's family help him other than medicines during the course of treatment? 1
- 28 i) Calculate the e.m.f of the cell $Mg_{(s)} / Mg^{2+}(0.1M) || Cu^{2+}(1.0 \times 10^{-3}M) / Cu_{(s)}$ 3
 Given $E^\circ_{Cu^{2+}/Cu} = +0.34 V$ and $E^\circ_{Mg^{2+}/Mg} = -2.37 V$.
 ii) What are fuel cells? Write one advantage of fuel cells over other cells. 2
 (or)
- i) The resistance of a conductivity cell containing 0.001 M KCl solution at 298 K is 1500Ω. What is the cell constant, if the conductivity of 0.001 M KCl solution at 298 K is 0.146 x 10⁻³ S cm⁻¹? 2
- ii) Explain with one example each the terms weak and strong electrolytes. 2
- iii) The standard reduction potential values of three metallic cations X, Y, Z are +0.52, -3.03, -1.18 V respectively. What will be the order of reducing power of the corresponding metals? 1
- 29 Account for the following: 5
 i) Fluorine does not show variable oxidation states while other members of the halogen family exhibit variable oxidation states.
 ii) Iodine is more soluble in KI solution than in water.
 iii) Why do boiling points of noble gases increase down the group?
 iv) Why is ammonia a good complexing agent?
 v) Nitric oxide (NO) is a colourless gas becomes brown when released in air.

(or)

Complete the following chemical reactions:



Cold & Dilute



30 a) Describe the mechanism of the formation of alcohol from alkene in the presence of dilute acid. 2

b) Write the chemical equation for the following reactions:

i) Carbylamine reaction

ii) Cross aldol condensation

iii) Rosenmund reduction

(or)

a) Give chemical tests to distinguish between compounds in each of the following pairs: 2

i) Benzaldehyde and Acetone

ii) Phenol and Ethanol

b) Give reasons for the following:

i) Although $-NH_2$ group is an ortho and para directing group, nitration of aniline gives along with ortho and para as well as meta derivative also, why?

ii) Conc. HI is preferable used in the cleavage of ether linkage. Explain.

iii) Out of PCl_5 and $SOCl_2$ which one is a better reagent for the conversion of alcohol to alkyl chloride and why?

SAMPLE QUESTION PAPER

CHEMISTRY

CLASS XII

Design of Question paper

Time: 3 hrs.

Maximum Marks:70

A. Weightage to different forms of questions

S. No.	Type of question	Marks per Question	Total number of Questions	Total marks
1	VSA	1	8	8
2	SA I	2	10	20
3	SA II/Value Based Question	3	9	27
4	LA	5	3	15
Total			30	70

B. Typology of Questions

S. No.	Typology	Weightage in marks	Weightage in percentage
1	Knowledge Based	14	20%
2	Conceptual Understanding	21	30%
3	Inferential Type	14	20%
4	Reasoning Based	11	15%
5	Skill Based	10	15%
	Total	70	100%

C. Scheme of options

There will be no overall choice. However, internal choice in any one question of two marks, any one question of three marks and all the three questions of five marks weightage has been provided.

D. Difficulty level of questions

S. No.	Estimated difficulty level	Percentage of marks
1	Easy	15
2	Average	70
3	Difficult	15

**SAMPLE QUESTION PAPER
CHEMISTRY (043)
CLASS-XII
BLUE PRINT**

Time Allowed: 3 Hrs.

Maximum Marks:70

S.No.	UNIT	VSA (1 Mark)	SAI (2 Marks)	SAII(3)/ Value based question (3marks)	LA (5 marks)	TOTAL
1.	Solid State		4(2)			4 (2)
2.	Solutions				5 (1)	5 (1)
3.	Electrochemistry		2(1)	*3(1)		5(2)
4.	Chemical Kinetics	1(1)	4(2)			5(3)
5.	Surface Chemistry	1(1)		3(1)		4(2)
6.	General Principles and Processes of Isolation of Elements			3(1)		3(1)
7.	p-block Elements	1(2)		3(2)		8(4)
8.	d & f- Block Elements				5(1)	5(1)
9.	Co-ordination Compounds	1(1)	2(1)			3(2)
10.	Haloalkanes and Haloarenes		2(2)			4(2)
11.	Alcohols, Phenols & Ethers	1(1)		3(1)		4(2)
12.	Aldehydes, Ketones & Carboxylic Acids	1(1)			5(1)	6(2)
13.	Organic Compounds Containing Nitrogen		4(2)			4(2)
14.	Biomolecules	1(1)		3(1)		4(2)
15.	Polymers			3(1)		3(1)
16.	Chemistry in Everyday Life			3(1)		3(1)
	Total:	8(8)	20(10)	27(9)	15(3)	70(30)

Key: Total marks (no. of questions)

*** Value Based Question**

NOTE :

- Value Based Questions may be asked from any unit / chapter / topic.
- It will carry 3-5 marks.

SAMPLE QUESTION PAPER
CHEMISTRY (043)
CLASS-XII – (2013-14)

Time Allotted: 3 Hrs

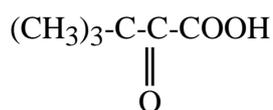
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6. Use log tables if necessary, use of calculators is not allowed.

Q.1 Bond enthalpy of fluorine is lower than that of chlorine, why?

Q.2 Give the IUPAC name of the following compound:



Q.3 On increasing temperature, activation energy of a reaction decreases, why?

Q.4 Which of the following is most effective electrolyte in the coagulative of AgI/Ag+sol?
K₂SO₄, MgCl₂, K₄[Fe(CN)₆]

Q.5 Write the reaction when glucose is heated with excess of HI.

Q.6 Which Xe compound has distorted octahedral shape?

Q.7 What is the denticity of co-ordination compound used for the treatment of lead Poisoning?

Q.8 An alkoxide is a stronger base than hydroxide ion. Justify.

Q.9 (a) State the law which helps to determine the limiting molar conductivity of weak electrolyte.

(b) Calculate limiting molar conductivity of CaSO₄ (limiting molar conductivity of calcium and sulphate ions are 119.0 and 160.0 S cm² mol⁻¹ respectively).

Q.10 Rate constant K for first order reaction has been found to be $2.54 \times 10^{-3} \text{ sec}^{-1}$. Calculate its three-fourth life.

OR

A first order gas reaction $\text{A}_2(\text{g})\text{B}_2(\text{g}) \rightarrow 2\text{A}(\text{g}) + 2\text{B}(\text{g})$ at the temperature 400°C has the rate Constant $K = 2.0 \times 10^{-4} \text{ sec}^{-1}$. What percentage of A_2B_2 is decomposed on heating for 900 seconds.

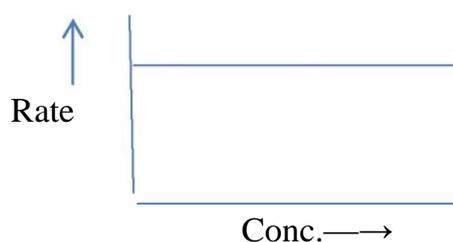
Q.11 Do the following conversions:

- (i) Methyl bromide to acetone.
- (ii) Benzyl chloride to 2-phenyl acetic acid.

Q.12 How will you distinguish between the following pairs of compounds:

- (i) Chloroform and carbon tetra chloride.
- (ii) Benzyl alcohol and chlorobenzene.

Q.13 For a chemical reaction variation in rate with conc. is shown below:



What is the order of the reaction?

What are the units of rate constant K for the reaction?

Q.14 Give the electronic configuration of d-orbitals of $K_3 [Fe(CN)_6]$ and $K_3 [FeF_6]$ and explain why these complexes give different colour with same solution.

(At. No. Of Fe=26u)

Q.15 Give reason for the following:

- (i) O-Toludine is more basic than aniline.
- (ii) Tertiary amines do not undergo acetylation reaction.

Q.16 Write the following name reaction:

- (i) Gabriel phthalimide reaction.
- (ii) Hoffman bromamide reaction.

Q.17 Silver metal crystallises with a face centred cubic lattice. The length of unit cell is found to be 4.077×10^{-8} cm. Calculate atomic radius and density of silver.
(atomic mass of Ag = 108u, $N_A = 6.02 \times 10^{23} \text{ mol}^{-1}$)

Q.18 Calculate packing efficiency in ccp structure.

Q.19 Manu and his father went to a shop to purchase a battery for their inverter. Shopkeeper showed them two types of batteries, one with lead plates and the other with cadmium plates. The battery with cadmium plates was more expensive than the lead battery. They decided to purchase lead battery as it was cheaper.

After reading the above passage, answer the following questions:

- a) As a student of chemistry, why would you suggest to Manu and his father to buy the expensive cadmium plate battery. Give two reasons.
- b) Which two values will you be promoting through your suggestions?

Q.20 Give a reason for the following:

- (i) Rough surface of catalyst is more effective than smooth surface.
- (ii) Smoke passed through charged plates before allowing it to come out of chimneys in factories.
- (iii) Ne gets easily absorbed over charcoal than He.

Q.21 (a) Give one example of each of the following:

- (i) Acidic flux (ii) Basic flux
- (b) What happens when:
 - (i) Cu_2O undergoes self reduction in a silica line converter.
 - (ii) Haematite oxidises carbon to carbon monoxide.

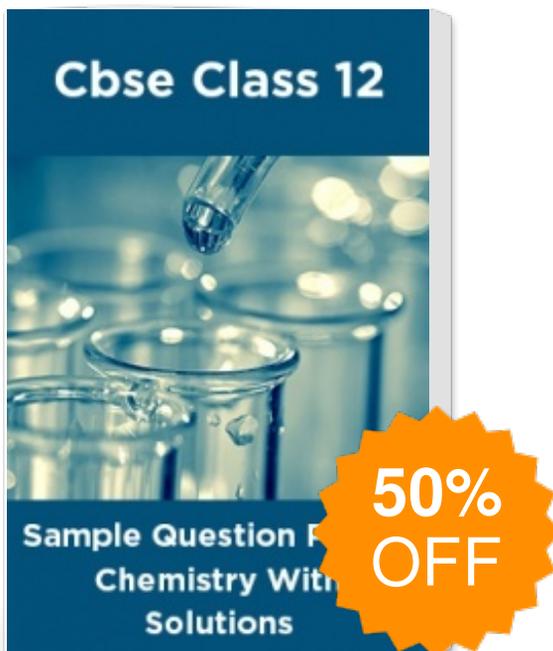
OR

- (a) What role does cryolite play in Hall Haraoult process?
- (b) How can alumina be separated from silica in a bauxite ore associated with silica? Give equations also.

Q.22 Write balanced chemical equations for the following reactions.

- (a) Hypophosphorous acid is added to AgNO_3 solution.
- (b) Chlorine gas is passed through hot and concentrated solution of sodium hydroxide.
- (c) XeF_2 undergoes hydrolysis.

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