

SATISH SCIENCE ACADEMY

DHANORI PUNE-411015

CHEMISTRY

Class 12 - Chemistry

Time Allowed: 3 hours

Maximum Marks: 70

General Instructions:

The question paper is divided into **four sections**:

1. Section A

- Q. No. 1 contains **Ten multiple choice type** of questions carrying **One mark** each.
- Q. No. 2 contains **Eight very short answer type** of questions carrying **One mark** each.

2. Section B

• Q. No. 3 to Q. No. 14 contain **Twelve short answer type** of questions carrying **Two marks** each. (Attempt any Eight).

3. Section C

• Q. No. 15 to Q. No. 26 contain **Twelve short answer type** of questions carrying **Three marks** each. (Attempt any Eight).

4. Section D

- Q. No. 27 to Q. No. 31 contain **Five long answer type** of questions carrying **Four marks** each. (Attempt any Three).
- 5. Use of the log table is allowed. Use of calculator is not allowed.
- 6. Figures to the right indicate full marks.
- 7. For each MCQ, correct answer must be written along with its alphabet. e.g., (a).... / (b)/ (c)...... / (d)...... Only first attempt will be considered for evaluation.

8. Physical constants:- i) ------ iii) ------ iii) ------

Section A

1.	Select and write the correct answer:		[10]	
	(a)	p-type semi-conductors are made by mixing silicon with impurities of		[1]
		a) antimony	b) arsenic	
		c) germanium	d) boron	
	(b)	The pH of weak monoacidic base is 11.2	, its OH^- ion concentration is:	[1]
		a) $1.585 imes 10^{-11} \ mol \ dm^{-3}$	b) $3.010 imes 10^{-3} \ mol \ dm^{-3}$	
		c) $3.010 imes 10^{-11} \ mol \ dm^{-3}$	d) $1.585 imes 10^{-3}\ mol\ dm^{-3}$	

(c)	The integrated rate equation for first order reaction $A o$ products is	[1]
	a) $k = rac{1}{t} \ln rac{[A]_t}{[A]_0}$ b) $k = -rac{1}{t} \ln rac{[A]_t}{[A]_0}$	
	c) $k = \frac{2.303}{t} \log_{10} \frac{[A]_t}{[A]_0}$ d) $k = 2.303t \log_{10}$	$\frac{[A]_0}{[A]_1}$
(d)	The spin only magnetic moment of Mn^{2+} ion is	[1]
	a) 5.916 BM b) 4.901 BM	
	c) 3.873 BM d) 2.846 BM	
(e)	The coordination number of cobalt in $[CoCl_2(en)_2]^+$ is:	[1]
	a) 2 b) 0	
	c) 6 d) 4	
(f)	But-1-ene on reaction with HCl in the presence of sodium peroxide viel	ds [1]
(1)	a) tertiary butyl chlorida	hlorida
	a) tertiary butyr chioride b) secondary butyr c	monue
	c) n-butyl chloride d) isobutyl chloride	
(g)	Which of the following is a trihydric alcohol?	[1]
	a) Glycol b) n-Propyl alcohol	
	c) Glycerol d) Glycine	Y
(h)	Which of the following is NOT present in DNA?	[1]
	a) Guanine b) Adenine	
	c) Uracil d) Thymine	
(i)	ZWT in green chemistry stands for:	[1]
	a) zubl water technology b) zero waiting time	
	c) zhen wu tang d) zero waste techno	logy
(j)	Which of the following is the first oxidation product of secondary alcoh	ol? [1]
	a) Ketone b) Alkene	
	c) Aldehyde d) Carboxylic acid	
Answe	er the following:	[8
(a)	Write the name of metal nanoparticle used to remove E.coli bacteria fro	m water. [1]
(b)	How is ethanamine prepared by using methyl cyanide?	[1]
(c)	Define racemic mixture.	[1]
(d)	Write the name of radioactive element in group 16.	[1]
(e)	Write the name of a hexadentate ligand.	[1]
(f)	Define semipermeable membrane.	[1]
(g)	Write the sign convention of work done during expansion of gas.	[1]
(h)	Write the net cell reaction during discharging of lead accumulator.	[1]
	Section B	
	Attempt any 8 questions	
Mentio	on the names of various steps involved in the extraction of pure metals from	m their ores. [2]

2.

3.

5. Define nanochemistry. 6. What happens when phenol is heated with zinc das? 7. Write a note on Friedel Craft's acylation. 8. Give the limitations of Arthenius theory of acids and bases. 9. What is the action of benzene sulphonyl chloride on ethanamine? 10. For a certain reaction ΔH^2 is $-224kJ$ and ΔS^2 is $-153J K^{-1}$. At what temperature the change over from spontaneous to nonspontaneous will occur? 10. What are amino acids? Write the correct reaction for formation of peptide bond between amino acids. 12. Write the correct condition for spontaneous for formation of peptide bond between amino acids. 13. Write chemical reactions to prepare the following polymers: 14. I. Fellon 15. Nylon 6 14. Explain anomalous behaviour of oxygen in group 16 with respect to: 15. Atomicitly 16. Nylon 6 17. Define the following terms: 17. J. Sotonic solution 18. Hypertonic solution 19. Hypertonic solution 19. Hypertonic solution 10. Hypertonic solution 11. Hypertonic solution 12. How much electricity in terms of Faraday is required to produce: 13. 20 g of Ca from molten d_2O_3 15. Given: Molar mass of calcium and aluminum are 40 g mol ⁻¹ and 27 g mol ⁻¹ respectively.] 18. How is propene converged into 1-bromopropane and 2-bromopropane? 19. For the reaction: 10. Nylon d_2O_3 11. Given: Molar mass of calcium and aluminum are 40 g mol ⁻¹ and 27 g mol ⁻¹ respectively.] 18. How is propene converged into 1-bromopropane and 2-bromopropane? 19. For the reaction: 10. $N_2O_1 \rightarrow 2NO_3$ 11. Given is to protok difference between futor it on ore? 21. Solubility product of magnesium hydroxide is 1.4×10^{-11} . Calculate the solubility of magnesium hydroxide. 22. Explain catonic complexes and anomic complexes of coordination compounds. 23. Distinguish between molecularity and order of reaction. 24. Write the structure and IUPAC names of isomeric aldehydes having molecular formula $C_kH_{10}O_i$ 25. Write any four points of difference between fluorine and other halogens. 26. Answer the	4.	Define van't Hoff factor. How is it related to the degree of dissociation?	[2]	
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		(a) Convert: Dry ice into acetic acid.	[2]	

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		Section D	
		Attempt any 3 questions	
27. Answer the following:			[4]
	(a)	Write Arrhenius equation. Derive an expression for temperature variations.	[2]
	(b)	Calculate magnetic moment of $Fe^{2+}{}_{(aq)}$ ion $[Z=26].$	[1]
	(c) Write the name of nanostructured material used in car tyres to increase the life of tyres.		[1]
28.	Answe	er the following:	[4]
	(a)	Under what conditions work done by a gas is zero ?	[2]
	(b)	(b) Define vulcanization.	
	(c)	State the function of insulin.	[1]
29.	Answe	er the following:	[4]
	(a)	Face centred cubic crystal lattice of copper has density of $8.966~g~cm^{-3}$. Calculate the volume of the	[2]
		unit cell.	
		[Given: Molar mass of copper is $63.5~g~mol^{-1}$ and Avogadro number N_A is $6.022 imes 10^{23}~mol^{-1}$]	
	(b)	Complete and rewrite the balanced chemical equation for the following reactions:	[2]
		i. Benzaldehyde $\xrightarrow{50\% KOH}$?	
		ii. Acetone + phenylhydrazine $\xrightarrow{H^+}$?	
30.	Answer the following:		[4]
	(a)	Define ligand.	[2]
	(b)	Write SI unit of molar conductivity.	[1]
	(c)	Write the chemical composition of cryolite.	[1]
31.	Answe	er the following:	[4]
	(a)	i. What are ethers?	[2]
		ii. How are they classified?	
	(b)	How is oxygen prepared from PbO_2 ?	[2]

What is the action of benzene diazonium chloride on ethanol?

(b)

[1]