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FOR GOA CLASS 12 PREPARATION

Goa Board Class 12 Sample Paper 2027 Chemistry

EXAM	YEAR	TYPE	SUBJECT
Goa Class 12	2027	Sample Paper	Chemistry

GOA BOARD OF SECONDARY AND HIGHER SECONDARY EDUCATION

CLASS: XII SUBJECT: **CHEMISTRY**

Revised Syllabus-2026-2027

Solutions	**10 Periods**
Types of solutions, expression of concentration of solutions of solids in liquids, solubility of gases in liquids, vapour pressure of liquid solutions, Raoult's law ,Ideal solutions & Non ideal solutions, colligative properties – relative lowering of vapour pressure, elevation of B.P., depression of freezing point, osmosis, reverse osmosis & osmotic pressure, determination of molecular masses using colligative properties, abnormal molecular mass, Vant Hoff factor(excluding numericals using vant Hoff factor).	
Electrochemistry	**12 Periods**
Electrochemical cell, Galvanic cell, Measurement of electrode potential, Nernst equation and its application to chemical cells Equilibrium constant from Nernst equation, Relation between Gibbs energy change and EMF of a cell, conductance in electrolytic solutions, specific and molar conductivity, variations of conductivity with concentration, Kohlrausch's Law, electrolysis and law of electrolysis (elementary idea), dry cell-electrolytic cells and Galvanic cells, lead accumulator, fuel cells, corrosion	
Chemical Kinetics	**10 Periods**
Rate of a reaction (Average and instantaneous), factors affecting rate of reaction: concentration, temperature, catalyst; elementary and complex reactions, order and molecularity of a reaction, rate law and specific rate constant, integrated rate equations and half-life (only for zero and first order reactions), concept of collision theory (elementary idea, no mathematical treatment), Effect of temperature on the rate of reaction, Arrhenius equation, activation energy and its calculations. Effect of catalyst on the rate of reaction	
d and f Block Elements	**12 Periods**
General introduction, electronic configuration, occurrence and characteristics of transition metals, general trends in properties of the first row transition metals – metallic character, ionization enthalpy, oxidation states, ionic radii, colour, catalytic property, magnetic properties, interstitial compounds, complex formation ,alloy formation, preparation and properties of K2Cr2O7 and KMnO4 and structures of chromate ion, dichromate ion, manganate ion and permanganate ion. **Lanthanoids** - Electronic configuration, oxidation states, chemical reactivity and lanthanoid contraction and its consequences. **Actinoids** - Electronic configuration, oxidation states, ionic sizes and comparison with lanthanoids.	
Coordination Compounds	**12 Periods**
Coordination compounds - Introduction, definition of important terms pertaining to coordination compounds, IUPAC nomenclature of mononuclear coordination compounds. Bonding, Werner's theory, VBT , magnetic properties , limitations of VBT Basic Ideas of CFT(excluding diagrams) colour ,limitations of CFT, ,structural and stereoisomerism, importance of coordination compounds (in qualitative analysis, extraction of metals and biological system).	

Haloalkanes and Haloarenes.	**10 Periods**
Haloalkanes: Nomenclature, classification ,methods of preparation, nature of C–X bond, **physical and chemical properties, optical rotation, mechanism of substitution reactions ,Stereochemical aspects of nucleophilic substitution . Haloarenes: Nomenclature, Nature of C–X bond, methods of preparation, substitution reactions (Directive influence of halogen in monosubstituted compounds only) ,electrophilic substitution reactions, reactions with metals. Polyhalogen compounds - dichloromethane, trichloromethane, tetrachloromethane, iodoform, freons, DDT.**	
Alcohols, Phenols and Ethers	**10 Periods**
Alcohols: Classification, Nomenclature, methods of preparation, physical and chemical properties identification of primary, secondary and tertiary alcohols(Oxidation ,dehydrogenation reactions and Lucas test), mechanism of dehydration, **Phenols**: Nomenclature, methods of preparation, physical and chemical properties, acidic nature of phenol, Reactions of Phenol. **Ethers**: Nomenclature, methods of preparation, physical and chemical properties.	
Aldehydes, Ketones and Carboxylic Acids	**10 Periods**
Aldehydes and Ketones: Nomenclature, nature of carbonyl group, methods of preparation, physical and chemical properties, mechanism of nucleophilic addition, reactivity of alpha hydrogen in aldehydes, uses. **Carboxylic Acids**: Nomenclature, acidic nature, methods of preparation, physical and chemical properties; uses.	
Amines	**10 Periods**
Amines: Nomenclature, classification, structure, methods of preparation, physical and chemical properties, uses, identification of primary, secondary and tertiary amines. **Diazonium salts**: Preparation, chemical reactions.	
Biomolecules	**12 Periods**
Carbohydrates :Classification (aldoses and ketoses), monosaccharides (glucose and fructose), D-L configuration, oligosaccharides (sucrose, lactose, maltose), polysaccharides starch, cellulose, glycogen (excluding structures) **Proteins** - Elementary idea of alpha - amino acids(only structure of Glycine and Alanine) classification, peptide bond, polypeptides, proteins, primary structure, secondary structure, tertiary structure and quaternary structure (qualitative idea only), denaturation of proteins :enzymes. Hormones - Elementary idea excluding structure. **Vitamins** – Classification and functions. **Nucleic Acids:** DNA and RNA(excluding structures).	

2026-27

GOA BOARD OF SECONDARY AND HIGHER SECONDARY EDUCATION

CLASS: XII SUBJECT: **CHEMISTRY SUB CODE:H-4703**

Exam		Mid Term	First Term	Board Exam
Month		Aug	Oct	Feb
Sr No	**Unit**			
1	SOLUTIONS	5±1	8+1	7±1
2	ELECTROCHEMISTRY		9±1	9±1
3	CHEMICAL KINETICS	5±1	8+1	7±1
4	THE d-& f-BLOCK ELEMENTS	5±1	8±1	7±1
5	COORDINATION COMPOUNDS			7±1
6	HALOALKANES & HALOARENES	5±1	7+1	6±1
7	ALCOHOLS, PHENOLS AND ETHERS		7±1	6±1
8	ALDEHYDES, KETONES AND CARBOXYLIC ACIDS			8±1
9	AMINES		6+1	6±1
10	BIOMOLECULES		7±1	7±1
Sr No	**Question Details**			
1	MAXIMUM MARKS	20	60	70
2	DURATION IN MINUTES	60	150	180
3	NUMBER OF QUESTIONS	10	31	35
4	MULTIPLE CHOICE QUESTION (1MARK)	2	8	8
5	VERY SHORT ANSWER (VSA) (1 MARK)	2	4	5
6	SHORT ANSWER I (SA I)—2 MARKS	3	12	12
7	SHORT ANSWER (SA II)—3 MARKS	2	4	7
8	LONG ANSWER (LA) —4 MARKS	1	3	3
9	KNOWLEDGE %	30 ±5	30 ±5	30 ±5
10	UNDERSTANDING %	40±5	40±5	40±5
11	SKILL(Diag/Structure/Graph) %	10±5	10±5	10±5
12	APPLICATION %	20 ±5	20 ±5	20 ±5
	Difficulty Level			
1	EASY	30±5	**30±5**	**30±5**
2	AVERAGE	50±5	**50±5**	**50±5**
3	DIFFICULT	20±5	**20±5**	**20±5**

SCHEME OF EXAMINATION AND MARKS DISTRIBUTION (2026- 27)

Internal assessment : 20/2=10 MARKS

FIRST TERM PRACTICAL EXAMINATION

VOLUMETRIC ANALYSIS	**16 Marks**
JOURNAL + VIVA	**04 Marks (2+2)**
TOTAL	**20 Marks**
DURATION	**120 Minutes**

GOA BOARD PRACTICAL EXAMINATION

VOLUMETRIC ANALYSIS	**08 Marks**
JOURNAL + VIVA	**02 Marks (01+01)**
ANALYSIS OF SALT	**10 Marks**
TOTAL	**20 Marks**
DURATION	**180 Minutes (Three Hours)**

2026-27

MODEL BLUEPRINT OF MID TERM TEST (2026 – 2027)

XII SCIENCE SUBJECT : CHEMISTRY MARKS : 20 DURATION : 60min

	OBJECTIVES					DIFFICULTY LEVEL		
	K	U	S	A		Easy(E)	Average (Av)	Difficult(D)
Percentage	30%	40%	10%	20%		30%	50%	20%
Marks	6	8	2	4		6	10	4

Variation of ± 5% is permitted in the above Objectives and Difficulty Level

Type of question	Marks per Question	No. of Questions	Total marks
MCQ	1	2	2
VSA	1	2	2
SA- I	2	3	6
SA- II	3	2	6
LA	4	1	4
Total	……..	10	20

MCQ = Multiple choice Question
VSA = Very Short Answer
SA – I = Short answer type -I
SA – II = Short answer type – II
LA = Long Answer

GOA BOARD OF SECONDARY AND HIGHER SECONDARY EDUCATION ,

ALTO-PORVORIM GOA.

BLUEPRINT OF MIDTERM TEST 2026-2027 (CHEMISTRY – XII SCIENCE)

Q. No.	Type	Unit Name	Objectives	Difficulty Level	Duration (min)	Marks
1	MCQ	Solutions	K	E	2	1
2	MCQ	The 'd' and 'f' block elements	U	Av	2	1
3	VSA	Haloalkanes and Haloarenes	K	E	2	1
4	VSA	The 'd' and 'f' block elements	S	E	2	1
5	SA-I	Chemical Kinetics	A	D	5	2
6* 6*	SA-I SA-I	Solutions OR Solutions	K + S	Av	4	1+1=2
7	SA-1	Solutions	A	D	5	2
8	SA-II	The 'd' and 'f' block elements	K	E	8	3
9	SA-II	Chemical kinetics	U	Av	8	3
10* 10*	LA LA	Haloalkanes and Haloarenes OR Haloalkanes and Haloarenes	U	Av	12	4
TOTAL DURATION IN MINUTES AND MARKS					50 min	20mks

*Internal Choice

2026-27

GOA BOARD OF SECONDARY AND HIGHER SECONDARY EDUCATION

ALTO PORVORIM - GOA.

MODEL BLUEPRINT OF THE QUESTION PAPER FOR FIRST TERM EXAM (2026 – 2027)

STD: XII SCIENCE SUBJECT: CHEMISTRY

MAXIMUM MARKS : 60 DURATION: 150 min.

	OBJECTIVES					DIFFICULTY LEVEL		
	K	U	S	A		Easy (E)	Average (Av)	Difficult (D)
Percentage	30 %	40 %	10 %	20 %		30%	50%	20%
Marks	18	24	6	12		18	30	12

Variation of ± 5% is permitted in the above objectives and Difficulty level.

Type of Questions	Marks	Number of questions	Total marks
MCQ	1	8	8
VSA	1	4	4
SA - I	2	12	24
SA - II	3	4	12
LA	4	3	12
TOTAL	**-----**	**31**	**60**

MCQ=Multiple Choice question

VSA = Very Short Answer

SA I = Short Answer type I

SA II= Short Answer type II

LA = Long Answer

Choice to be provided for one question of 2 mks, one question of 3 mks and one question of 4 mks.

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MODEL BLUEPRINT OF THE QUESTION PAPER FOR FIRST TERM EXAM (2026 – 2027)

STD : XII SCIENCE SUBJECT : CHEMISTRY DURATION : 150 min. MARKS: 60

Q. No.	NAME OF THE UNIT	OBJECTIVE	DIFFICULTY LEVEL	TYPE	DURATION IN MINUTES	MARKS
1	BIOMOLECULES	U	Av	MCQ	2	1
2	ELECTROCHEMISTRY	U	Av	MCQ	2	1
3	THE d-& f-BLOCK ELEMENTS	U	Av	MCQ	2	1
4	AMINES	A	D	MCQ	2	1
5	ALCOHOLS, PHENOLS AND ETHERS	U	Av	MCQ	2	1
6	CHEMICAL KINETICS	U	Av	MCQ	2	1
7	HALOALKANES AND HALOARENES	U	Av	MCQ	1	1
8	SOLUTIONS	A	D	MCQ	2	1
9	AMINES	K	E	VSA	2	1
10	BIOMOLECULES	U	Av	VSA	2	1
11	THE d-& f-BLOCK ELEMENTS	S	Av	VSA	1	1
12	HALOALKANES AND HALOARENES	U	Av	VSA	2	1
13	CHEMICAL KINETICS	U	Av	SA-I	5	2
14	BIOMOLECULES	K	E	SA-I	4	2
15	SOLUTIONS	S+K	Av	SA-I	5	1+1
16	ELECTROCHEMISTRY	K	E	SA-I	5	2
17	AMINES	U	Av	SA-I	7	2
18*	HALOALKANES AND HALOARENES	K	E	SA-I	6	2
18*	HALOALKANES AND HALOARENES	K	E	SA-I	6	2

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Q. No	NAME OF TOPIC	OBJECTIVE	DIFFICULTY LEVEL	TYPE	DURATION IN MINUTES	MARKS
19	THE d-& f-BLOCK ELEMENTS	K	E	SA-I	5	2
20	ELECTROCHEMISTRY	S	E	SA-I	4	2
21	ALCOHOLS, PHENOLS AND ETHERS	K	Av	SA-I	6	2
22	CHEMICAL KINETICS	K	E	SA-I	6	2
23	SOLUTIONS	U	Av	SA-I	6	2
24	AMINES	K	E	SA-I	5	2
25	HALOALKANES AND HALOARENES	A	D	SA-II	8	3
26	CHEMICAL KINETICS	S+K	E	SA-II	7	1+2
27	BIOMOLECULES	U	Av	SA-II	7	3
28*	SOLUTIONS	A	D	SA-II	7	3
28*	SOLUTIONS	A	D	SA-II	7	3
29	ELECTROCHEMISTRY	S+U	Av	LA	10	1+3
30	THE d-& f-BLOCK ELEMENTS	U	Av	LA	7	4
31*	ALCOHOLS, PHENOLS AND ETHERS	A	D	LA	8	4
31*	ALCOHOLS, PHENOLS AND ETHERS	A	D	LA	8	4
TOTAL DURATION IN MINUTES AND MARKS					140 min	60 mks

***Internal choice**

Blue Print of Model paper of HSSC Final Examination Feb/March-2027

Q. No.	Unit Name	Objective	Difficulty Level	Q-Type	Duration (min)	Marks
1	BIOMOLECULES	K	E	MCQ	1	1
2	SOLUTIONS	U	A	MCQ	2	1
3	CHEMICAL KINETICS	U	A	MCQ	2	1
4	THE d-& f-BLOCK ELEMENTS	K	E	MCQ	1	1
5	ELECTROCHEMISTRY	A	D	MCQ	3	1
6	HALOALKANES AND HALOARENES	U	A	MCQ	3	1
7	ALCOHOLS, PHENOLS AND ETHERS	U	A	MCQ	3	1
8	ALDEHYDES, KETONES AND CARBOXYLIC ACIDS	A	D	MCQ	3	1
9	THE d-& f-BLOCK ELEMENTS	S	A	VSA	3	1
10	BIOMOLECULES	K	E	VSA	2	1
11	ALCOHOLS, PHENOLS AND ETHERS	U	A	VSA	3	1
12	AMINES	A	D	VSA	4	1
13	CHEMICAL KINETICS	K	E	VSA	3	1
14	ELECTROCHEMISTRY	S	A	SA-I	4	2
15	ELECTROCHEMISTRY	A	D	SA-I	5	2
16	COORDINATION COMPOUNDS	K	E	SA-I	4	2
17	*COORDINATION COMPOUNDS OR	U	A	SA-I	5	2
17	COORDINATION COMPOUNDS	U	A	SA-I	5	2
18	BIOMOLECULES	U	A	SA-I	4	2
19	HALOALKANES AND HALOARENES	U	A	SA-I	6	2
20	CHEMICAL KINETICS	K	E	SA-I	4	2
21	ALCOHOLS, PHENOLS AND ETHERS	A	D	SA-I	7	2
22	ALCOHOLS, PHENOLS AND ETHERS	U	A	SA-I	5	2
23	SOLUTIONS	K	E	SA-I	5	2
24	THE d-& f-BLOCK ELEMENTS	K	E	SA-I	5	2
25	AMINES	U	A	SA-I	6	2
26	CHEMICAL KINETICS	A	D	SA-II	8	3
27	COORDINATION COMPOUNDS	S + U	A	SA-II	7	2 + 1
28	HALOALKANES AND HALOARENES	K	E	SA-II	8	3
29	*THE d-& f-BLOCK ELEMENTS OR	U	A	SA-II	7	3
29	THE d-& f-BLOCK ELEMENTS	U	A	SA-II	7	3
30	AMINES	K	E	SA-II	7	3
31	BIOMOLECULES	K	E	SA-II	6	3
32	ALDEHYDES, KETONES AND CARBOXYLIC ACIDS	U	A	SA-II	7	3
33	*SOLUTIONS OR	S + U	A	LA	9	2 + 2
33	SOLUTIONS	S + U	A	LA	9	2 + 2

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34	*ELECTROCHEMISTRY OR	**U**	**A**	**LA**	**9**	**4**
34	ELECTROCHEMISTRY	**U**	**A**	**LA**	**9**	**4**
35	*ALDEHYDES, KETONES AND CARBOXYLIC ACIDS OR	**A**	**D**	**LA**	**9**	**4**
35	ALDEHYDES, KETONES AND CARBOXYLIC ACIDS	**A**	**D**	**LA**	**9**	**4**
	TOTAL DURATION (MIN) & MARKS				**170**	**70**

GOA BOARD OF SECONDARY AND HIGHER SECONDARY EDUCATION
ALTO - PORVORIM GOA.
MODEL QUESTION PAPER FOR HSSC FINAL EXAMINATION IN CHEMISTRY
FEBRUARY/MARCH 2027

MAXIMUM MARKS : 70 DURATION :180 mins TOTAL NUMBER OF QUESTIONS : 35

INSTRUCTIONS **: (i) There are 35 Questions to answer. However Q. Nos. 17, 29, 33, 34 and 35 have internal choice.**
(ii) Answer each question only once.
(iii) Use of calculator is not permitted. Logarithm tables shall be supplied on request.
(iv) For Question Nos. 1 to 8, select and write the correct alternative from the options given below the statement.
(v) Question Nos. 1 to 13 carry *one* mark each.
(vi) Question Nos. 14 to 25 carry *two* marks each.
(vii) Question Nos. 26 to 32 carry *three* marks each.
(viii) Question Nos. 33 to 35 carry *four* marks each.

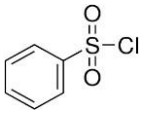
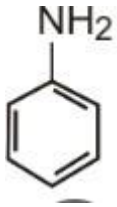
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Q.1	**Which among the following is an example of Globular protein?** • **Keratin** • **Enzymes** • **Myosin** • **Fibroin**	**1**
Q.2	The value of Henry's constant K_H is _____. • greater for gases with lower solubility. • greater for gases with higher solubility. • constant for all gases. • not related to the solubility of the gas.	**1**
Q.3	For a first order reaction the ratio of the time required for completion of 3/4th to the time required for completion of ½ is _____ • 1.5 • 2.0 • 2.5 • 3.0	**1**
Q.4	**Which transition element among the following has +8 oxidation state?** • **Osmium** • **Manganese**	**1**

	• **Molybdenum** • **Niobium**	
Q.5	**When hydrogen gas electrode is dipped in HCl solution it shows a potential of -0.177v at standard temperature and pressure, the pH of solution is found to be ____** • **2.07** • **0.73** • **1.00** • **3.00**	**1**
Q.6	Which of the following represents a geminal dihalide ? • Ethylene dichloride • 1,2-dichloropropane • 1,3-dichloropropane • 2,2-dichloropropane.	**1**
Q.7	**Which among the following alcohols undergo dehydration easily?** • **Ethanol** • **Propan- 1-ol** • **2- Methylpropan-1-ol** • **2-Methylpropan -2-ol**	**1**
Q.8	**The reagent used to convert p- Fluorotoluene to p- Fluorobenzaldehyde is……** • **PCC** • **O_3/H_2O-Zn dust** • **CO,HCl/Anhyd. $AlCl_3$** • **i) CrO_2Cl_2,CS_2, ii) H_3O^+**	**1**
Q.9	**Draw the structure of Chromate ion.**	**1**
Q.10	**Write the chemical name of Vitamin C.**	**1**
Q.11	**Write the structure of the major product formed when sodium salt of phenol is heated with CO_2 followed by acidification.**	**1**
Q.12	**An organic compound with molecular formula C_3H_9N on heating with chloroform and alcoholic KOH gives a product having extremely unpleasant smell.Write the structure of this product.**	**1**
Q.13	**Define Rate of reaction.**	**1**
Q.14	**Draw a neat labelled diagram of H_2-O_2 Fuel cell.**	**2**
Q.15	**The cell in which the following reaction occurs $2Fe^{3+}(aq) + 2I^- \longrightarrow 2Fe^{2+}(aq) + I_2$ has $E^0cell = 0.236v$ at 298k. Calculate the standard Gibbs free energy and Equilibrium constant for the reaction. (Given F =96500 C)**	**2**
Q.16	**Write IUPAC name of each of the following Complexes.** **(i) $K_3[Cr(C_2O_4)_3]$ (ii) $[Pt\,Br_2(CO)_2]$**	**2**
Q.17	**On the basis of VBT deduce the type of hybridisation and predict the magnetic property of the high spin complex $[Fe(H_2O)_6]^{+3}$**	**2**
	OR	
Q.17	**On the basis of VBT deduce the type of hybridisation and the number of unpaired electrons in the tetrahedral complex $[NiCl_4]^{-2}$**	**2**
Q.18	**Differentiate between DNA and RNA with respect to its secondary structure and the nitrogenous**	**2**

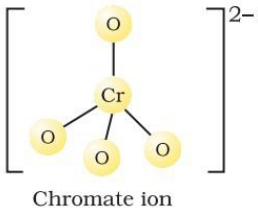
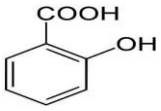
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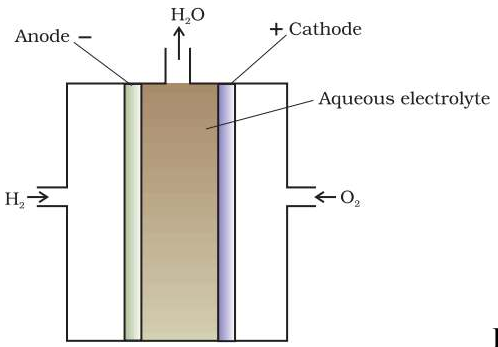
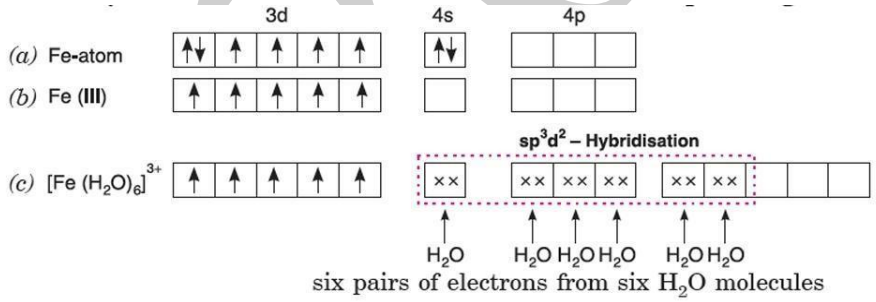
	bases present in them.	
Q.19	**Explain giving reasons for each of the following :** **(i) Chloroform is stored in dark coloured bottles filled up to the brim.** **(ii) Cyclohexylchloromethane undergoes SN-2 reaction faster than cyclohexylchloride**	**2**
Q.20	**A reaction is second order with respect to a reactant R,write the rate law expression and unit of rate constant k.**	**2**
Q.21	**An organic compound A having molecular formula C_2H_4O on treatment with Methylmagnesium Iodide followed by acid hydrolysis gives compound B.When Vapours of compound B are passed over heated copper at 573k,acetone is formed.Write the sequence of reactions involved and name the compounds A and B.**	**2**
Q.22	**Write chemical equations for the conversion of** **(i) Anisole to Phenol,** **(ii) Ethyl bromide to Diethyl ether.**	**2**
Q.23	**Define: (i) Molality (ii) Azeotropes**	**2**
Q.24	**State two consequences of Lanthanoid contraction.** **Write the electronic configuration of Gadolinium. (Z= 64)**	**2**
Q.25	**An amide on treatment with Bromine and alkali gets converted to aniline which has one carbon atom less than the amide.Write the structure of the amide.** **Arrange the following amines in the increasing order of their pK_b values** **CH_3NH_2, $C_6H_5NHCH_3$, $C_6H_5NH_2$, $(CH_3)_2NH$**	**2**
Q.26	**Radium decays into Helium and Radon. Write rate law expression and order for the decay reaction.** **The rate constants of a reaction at 500K and 700K are 0.08s^{-1} and 0.04s^{-1}respectively. Calculate activation energy of the reaction. (Given R= 8.314 J/K/mol)**	**3**
Q.27	**Draw the geometrical isomers of $[Pt(en)_2Cl_2]^{+2}$** **Why is a solution of $[Ni(H_2O)_6]^{+2}$ green in colour while that of $[Ni(CN)_4]^{-2}$ colourless ?**	**3**
Q.28	**Identify the structure or IUPAC name of the Compounds A, B and C in the following.** **(i) But-1-ene + HBr in presence of peroxides → *Compound A* (major product)** **(ii) Chlorobenzene + nitrating mixture → *Compound B* (major product)** **(iii) *Compound C* + Na metal / ether → 2,3 -dimethylbutane**	**3**
Q.29	**Write the ionic equation to show the disproportionation of K_2MnO_4 in acidic medium.** **Among the given transition metal ions of 3d series Zn^{2+} ,Cu^{2+}, Cr^{3+}, Sc^{2+}** **Select the ion which is most paramagnetic giving the reason.**	**3**
	OR	
Q.29	**Write the chemical equation for oxidation of Fe^{2+} by $Cr_2O_7^{2-}$ in acidic medium.** **Among the given transition metals of 4d & 5d series Zr, Mo,Hf,Cd** **Select the softest metal, giving reason.**	**3**
Q.30	**Name the major products L,M and N in the following reactions**	**3**

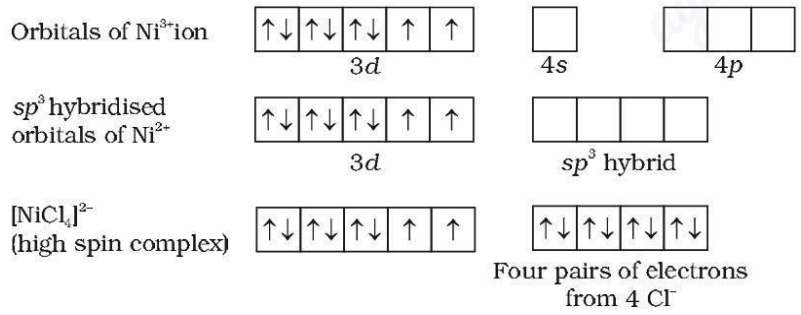
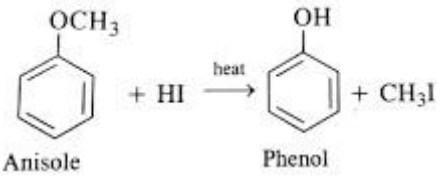
	$Ar\ N_2Cl + KI \longrightarrow L$  $+ C_2H_5NH_2 \longrightarrow M$  $\xrightarrow{Br_2/H_2O} N$	
Q.31	**State the effect of denaturation on the structure of protein?** **Name the two components of starch.** **Write the products obtained during hydrolysis of Lactose.**	**3**
Q.32	**Write chemical equations for each of the following and name the reaction .** **i) Benzoyl chloride is hydrogenated in the presence of Palladium and Barium sulphate.** **ii) Benzene is treated with acetyl chloride in presence of anhydrous aluminium chloride.** **iii) Acetone is treated with Zinc amalgam and concentrated Hydrochloric acid.**	**3**
Q.33	**Draw a neat labelled graph to illustrate the type of deviation from Raoult's Law by a mixture of ethanol and acetone.** **Ethylene glycol($C_2H_6O_2$) is an antifreeze agent. Calculate the mole fraction of ethylene glycol in an aqueous solution containing 20 percent of ethylene glycol by mass.** **(Given : at.mass C=12, H=1, O =16)**	**4**
	OR	
Q.33	**Draw a neat labelled graph to illustrate the effect on the boiling point of water upon the addition of common salt in it.** **An aqueous solution containing 21.6 milligram of a hormone in 100 ml of solution has an Osmotic Pressure of 0.00487 bars at 25 ^oC . Calculate the molar mass of the hormone.** **(Given : R = 0.0821 lit bar /K/ mole.)**	**4**
Q.34	**With respect to Leclanche cell answer the following:** **(i) Leclanche cell is also called primary battery. Explain.** **(ii) Which part of the cell acts as anode?** **(iii) Write the cathodic reaction taking place in this cell.** **(iv) Write the chemical composition of the paste used in between the two electrodes?**	**4**
	OR	
Q.34	**With respect to corrosion, answer the following.** **(i) Corrosion acts essentially as an Electrochemical cell. Explain** **(ii) Write the formula of the Rust.** **(iii) Write the cathodic reaction involved.** **(iv) Write the name of any one method for prevention of Corrosion.**	**4**
Q.35	**Complete the following chemical equations & label the compounds P, Q, R and S.** **1. P + Cl_2/hv, H_3O+ ----------> benzaldehyde**	**4**

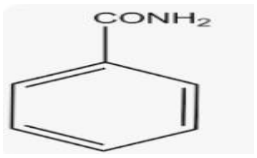
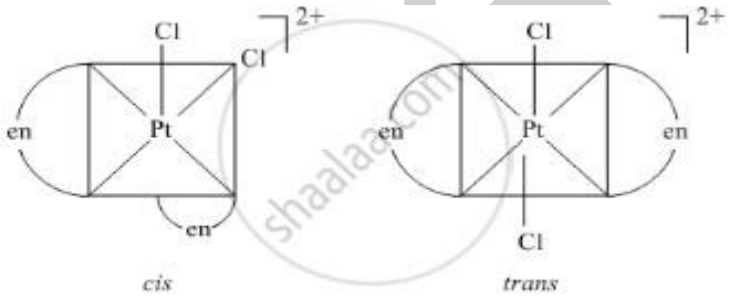
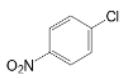
	2. 4-Oxocyclohexanecarbaldehyde + Tollen's reagent ----> Q 3. 2 mol of R + conc.kOH ---> Methanol + Potassium formate 4. S +NaOH+I_2 ----> Sodium benzoate +Iodoform	
	OR	
Q.35	Complete the following chemical equations & label the compounds W,X,Y and Z 1. W + H_2O, H^+ ------> 2- Methyl propanamide 2. X + CO_2, DDE, H_3O^+-----> n- Valeric Acid 3. Y + H_2O ----> Benzoic Acid + Ethanoic acid 4. Z + Àlkaline $KMnO_4$, H_30^+ ---> Benzoic Acid	4

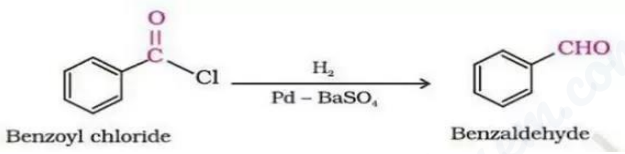
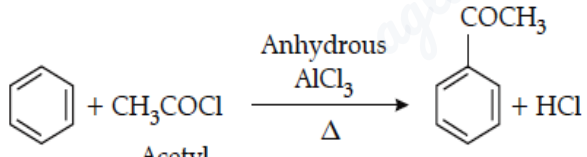
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ANSWERKEY TO MODEL QUESTION PAPER OF FINAL BOARD EXAM IN CHEMISTRY
FEBRUARY / MARCH 2027

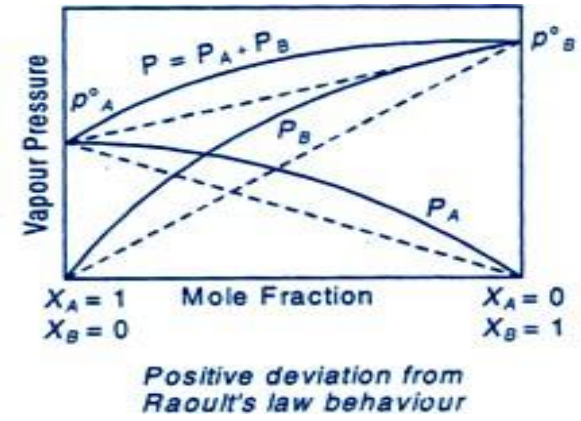
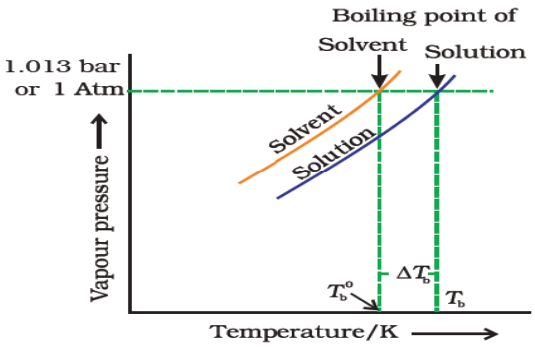
1	• Enzymes	1mk
2	• Greater for gases with lower solubility	1mk
3	• 2	1mk
4	• Osmium	1mk
5	• 3	1mk
6	• 2,2-dichloropropane	1mk
7	• 2-Methylpropan-2-ol	1mk
8	• i)CrO_2Cl_2, CS_2 ,ii) H_3O^+	1mk
9	 Chromate ion	1mk
10	Ascorbic acid	1mk
11		1mk

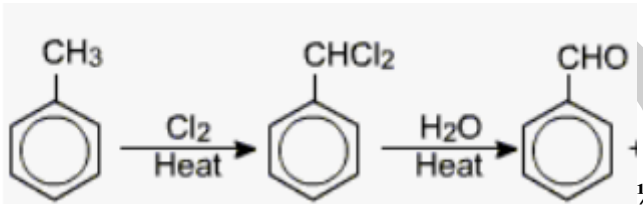
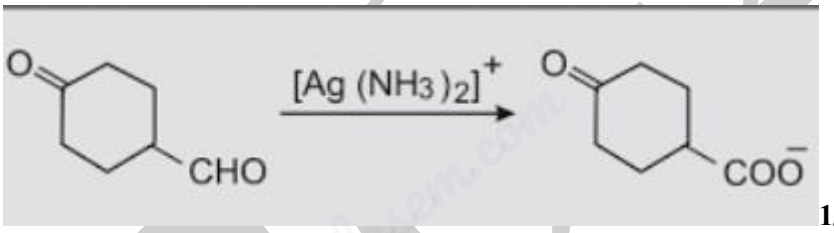
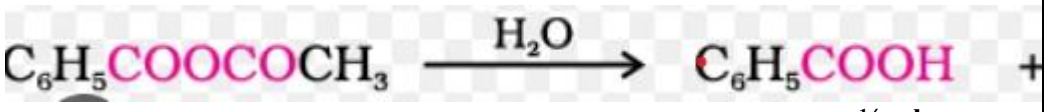
12	**$CH_3CH_2CH_2NC$**	**1mk**
13	**Change in concentration of a reactant or product in unit time .**	**1mk**
14	 **Diagram 1mk** **Any 2 labels 1mk**	**2mk**
15	**$\Delta G = -nFE^0cell$ - -------- >½** **$= -2 \times 96500 \times 0.236$** **= - 45,548 J/ mol ---------->½** **Log kc = n E^0cell/ 0.059-------- >½** **$= 2 \times 0.236 / 0.059$** **= 8.00** **Kc = 1.00×10^8 ---------- >½**	**2mk**
16	**(i) Potassium trioxalatochromate(III)** **(ii) Dibromidodicarbonylplatinum(II)**	**1mk + 1mk**
17	 **Fe(III) config = ½ mk** **$Fe(H_2O)_6]^{+3}$ config = ½ mk** **Type of hybridisation =$sp^3 d^2$ = ½ mk** **Magnetic property = paramagnetic =½ mk**	**2mk**
	OR	

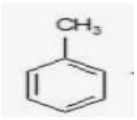
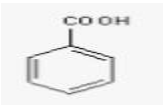
17	 **Ni(II) config = ½ mk** **$[NiCl_4]^{-2}$ config = ½ mk** **Hybridisation = sp^3 = ½ mk** **Number of unpaired electrons = 2= ½ mk**	**2mk**
18	**DNA is double-stranded, forming a double helix, while RNA is usually single-stranded.** **Bases present in DNA are adenine, thymine, cytosine, and guanine, while Bases present in RNA are adenine, uracil, cytosine, and guanine.**	**1mk + 1mk**
19	**(i) In presence of light and air chloroform undergoes oxidation to produce phosgene - a highly poisonous substance. So it is stored in dark coloured bottles filled upto the brim to keep out light and air.** **(ii) Because cyclohexylchloromethane is a primary halide, it undergoes SN-2 reaction faster.**	**I mk + 1mk**
20	**Rate = $k[A]^2$ 1mk** **$Lmol^{-1}s^{-1}$ 1mk**	**2mk**
21	**Dry ether,H+/H2O** **$CH_3CHO + CH_3MgI$ ----------> $(CH_3)_2–CH–OH$ ½ mk** **Cu,573K** **$(CH_3)_2CH\text{-}OH$ ----------> CH_3COCH_3 ½ mk** **A– Ethanal/Acetaldehyde ½ mk** **B–Propan-2-ol/isopropyl alcohol ½ mk**	**2mk**
22	 **1mk** **$CH_3CH_2Br + CH_3CH_2ONa$ ----------> $CH_3CH_2OCH_2CH_3 + NaBr$ 1mk**	**2mk**
23	***Molality*** **- it is defined as the number of moles of solute present in per kilogram of solvent** ***OR*** **number of gram moles of solute dissolved in 1000 grams of solvent.** ***Azeotropes*** **- are liquid mixtures which boil at same temperatures without undergoing any change in composition** ***OR*** **are binary mixtures having the same composition in liquid and vapour phase and boil at a constant temperature**	**1mk + 1mk**

24	**The consequences are as follows:** **The atomic radii of Zr and Hf are almost the same hence difficult to separate them.** **Covalent character of cations increases.** **Electronegativity of trivalent ions increases slightly.** **(Any two, ½ mark each)** **[Xe] 4 f ^{7} 5 d ^{1} 6 s ^{2}**	**1mk** **+** **1mk**
25	 **1mk** **$(CH_3)_2NH < CH_3NH_2 < C_6H_5NHCH_3 < C_6H_5NH_2$ 1mk**	**2mk**
26	**All radioactive decay follows 1st order 1/2mk** **Rate =K [Ra] 1/2mk** **Log K_2/k_1 = Ea / 2 303 R x T_2 - T_1/ T_1 x T_2 1/2mk** **Log 0.08/0.04 = Ea /2.303 ×8.314 × 200 / 500 × 700 1/2mk** **Log2 × 2.303 × 8.314 × 500 × 700/200 = Ea** **Ea = 10,085J/mol 1mk**	**3mk**
27	 **Each isomer = 1mk q** **Hexaaquanickel(II) has two unpaired electrons *(H_2O is a weak field ligand)*. So d-d transition is possible and it is hence coloured…1/2 mk** **Tetracyanonickelate(II) has no unpaired electrons(*CN is a strong field ligand*).So d-d transition is not possible and hence it is colourless..½ mk**	**3mk**
28	***Compound A* = 1-bromobutane CH_3 (**  ***Compound B* = 1-chloro-4-nitrobenzene** ***Compound C* = 2-chloropropane or 2-bromopropane or 2-iodopropane** **CH_3 CH(Cl)CH_3 CH_3 CH(Br) CH_3 CH_3CH(I) CH_3** ***Formula or IUPAC name of each = 1 mk***	**3mk**
29	$3MnO_4^{2-} + 4H^+ \rightarrow 2MnO_4^- + MnO_2 + 2H_2O$	**3mk**

	(½ mk for equation+ ½ mk for balancing) Cr^{3+} , (1mk) It has maximum no of unpaired electrons, i.e it has 3 unpaired electrons (1mk)	
	OR	
29	$Cr_2O_7^{2-} + 14\ H^+ + 6\ Fe^{2+} \rightarrow 2\ Cr^{3+} + 6\ Fe^{3+} + 7\ H_2O$ (½ mk for equation+ ½ mk for balancing) Cd (1mk) Weak interatomic metallic bonding &/fully filled 3d orbitals (1mk)	3mk
30	L = Iodobenzene 1 mk M = N-Ethylbenzenesulphonamide 1 mk N = 2,4,6-Tribromoaniline 1mk	3mk
31	Globules get unfolded and helixes get uncoiled. Secondary and tertiary structures of protein are destroyed, but the primary structures remain unaltered. (any one point 1mk) Amylose & Amylopectin (½ + ½ mk) Glucose & Galactose (½ + ½ mk)	3mk
32	 Benzoyl chloride Benzaldehyde Rosenmund Reduction  Benzene Acetyl chloride Acetophenone Friedel Craft Acylation $CH_3COCH_3 \xrightarrow{Zn(Hg)/HCl} CH_3CH_2CH_3$ Acetone Propane Clemmensen reduction Reaction !/2mk Name 1/2mk	3mk

33	 Positive deviation from Raoult's law behaviour *Graph = 1mk* *Labelling =1mk* **Molar mass of ethylene glycol =62** **Molar mass of water = 18** **Mass of ethylene glycol =20g** **Mass of water =80g** **Number of moles of ethylene glycol = 20 / 62 = 0.322** **Number of moles of water = 80/18 = 4.44** **Mole fraction of ethylene glycol = moles of ethylene glycol / Moles of ethyleneglycol+moles of water** **= 0.322 / 0.322 + 4.44** **= 0.0676** *Formula = ½ mark, Substitution = 1 mark , Ans = ½ mark*	4mk
	OR	
33	 *Graph = 1mk* *Labelling = 1mk* **Mass of hormone = 21.6 x 10 $^{-3}$gms** **Volume of solution = 100 / 1000 = 0.1 lit** **Osmotic pressure = 0.00487 bar** **Temperature = 25 + 273 = 298 K** **R= 0.0821 lit bar /k /mol** **Π V = w$_2$ RT / M$_2$** **Or M$_2$ = w$_2$ R T / Π V** **= 21.6 x 10 $^{-3}$ x 0.0821 x 298 / 0.00487 x 0.1 = 1085 g/mol** *Formula = ½ mk , Substitution = 1 mk , Answer = ½ mk*	4mk
34	**(i)Leclanche cell is also called primary cell because the reaction occurs only once and after use after a period of time the battery becomes dead and cannot be reused.**	4mk

	(ii)Anode - zinc (iii)Cathodic reaction $MnO_2 + NH_4^+ + 1e^- \longrightarrow MnO(OH)^- + NH_3$ (iv)Mixture of NH_4Cl & $ZnCl_2$ 1mk each x 4 = 4mks	
	OR	
34	(i)At one part of iron rod oxidation takes place and this spot acts as anode. Electrons released at anode move through metal and go to another spot and reduce oxygen and this spot act as cathode (ii)$Fe_2O_3.xH_2O$ (iii)$O_2(g) + 4H^+(g) + 4e^- \longrightarrow 2H_2O$ (iv)Use of paint or use of sacrificial anode like Mg, Zn or Sn 1mk each ×4 = 4mks	4mk
35	 ½ mk P = Toluene 1/2mk  1/2mk Q = 4-Oxocyclohexane carboxylate 1/2mk $2HCHO + KOH(conc) \longrightarrow CH_3OH + HCOOK$ 1/2mk R = Methanal/Formaldehyde ½ mk $C_6H_5COCH_3 + NaOH + I_2 \longrightarrow C_6H_5COONa + CHI_3$ 1/2mk S = Acetophenone ½ mk	4mk
	OR	
35	$(CH_3)_2CH-CN + H_2O/H^+ \longrightarrow (CH_3)_2CHCONH_2$ ½ mk W = 2– Methylpropanamide. ½ mk i) Dry ether $CH_3CH_2CH_2CH_2MgBr + CO_2 \longrightarrow CH_3CH_2CH_2CH_2COOH$ ½ mk ii) H_3O^+ X= n-Butylmagnesium bromide ½ mk  ½ mk Y= Benzoic ethanoic anhydride ½ mk	4mk

	 **Alkaline $KMnO_4$**  **½ mk** **—— ---------- >** **H_3O^+** **Z =Toluene ½ mk**	

FIRST TERM PRACTICAL EXAMINATION

VOLUMETRIC ANALYSIS	**16 Marks**
JOURNAL + VIVA	**04 Marks**
TOTAL	**20 Marks**
DURATION	**120 Minutes**

GOA BOARD FINAL PRACTICAL EXAMINATION

VOLUMETRIC ANALYSIS	**08 Marks**
JOURNAL + VIVA	**02 Marks (01+01)**
ANALYSIS OF SALT	**10 Marks**
TOTAL	**20 Marks**
DURATION	**180 Minutes (Three Hours)**

COMPUTATION OF INTERNAL MARKS : (**Max 10**)

1) For performing five activities in the school lab (may be carried out in a group of five to six students) and recording the same in the journal=10 Marks.

2) For Completing any one of the innovative methods=10 Marks.

COMPUTATION OF CHEMISTRY MARKS FOR FINAL HSSC EXAMINATION		
HSSC Theory examination	**70 Marks**	**180 Minutes**
HSSC Practical examination	**20 Marks**	**180 Minutes**
HSSC Internal Marks	**10 Marks**	
Total	**100 Marks**	

Note: *HSSC Internal Marks = Total 20 marks allotted for internal assessment to be divided by two to convert it to 10 marks

Goa Board of Secondary & Higher Secondary Education
Alto, Betim-Goa

Model Paper for First term Practical Examination-2026-27
CHEMISTRY

Date: Duration: **120** Minutes
Session: Max. Marks: **20**

N. B.

1) On your answer books write your Examination Seat number and your Laboratory table number.

2) Get the burette reading initialed by the Examiner.

3) Check if the number on (i) your table (ii) answer script and (iii) the containers A, B, and C are the same. If not, report immediately to the Examiner.

4) Use of non - programmable calculator is allowed.

Atomic Masses:- H=1, C=12, N=14, O=16, S=32, K=39, Mn=55, Fe= 56.

Q .1 You are provided with two solutions as follows:-

Container A:_____N/M stock solution of hydrated Oxalic acid / Mohr's salt.

Container B: $KMnO_4$ Solution

Using the stock solution from Container A, prepare 100 mL of _____N/M hydrated Oxalic acid /Mohr's salt in the given Standard Measuring flask C.

Using the solution prepared in flask C, determine N/M of the solution in container B.

Also calculate.

- The strength of the solution in container B in terms of grams per _____mL.
- The percentage purity of the solution in container B, _____g of which have been dissolved per _____mL. **(16 Marks)**

Q.2. Journal + Viva **(2+2 Marks)**

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Marking Scheme

Scheme for allotment of marks for First term practical examination

1. Volumetric analysis .....**16 marks**

a. Correct observations (burette solution, solution in the flask, indicator and colour change) (2 marks)

b. Calculation of correct volume..... 2 mark

c. Titre reading .....08 marks

Error in titre reading Marks

±0.2mL	8
±0.3mL	**6**
±0.4mL	4
±0.5mL	**2**
±0.6mL	**1**

d. Calculations.....2 + 2 mark (4Marks)

2. Journal + Viva ..... **2 + 2 mark**

****

2026-27

SEAT NO:- **TABLE NO:-**

Goa Board of Secondary & Higher Secondary Education
Alto, Betim-Goa

HSSC Practical Examination –FEB/MARCH 2027
CHEMISTRY

Date: Duration: 3 Hours
Session: Max. Marks: 20

N. B. 1) Write your Examination Seat number and your Laboratory table number on your answer book.
2) Get the burette reading and confirmatory tests initialed by one of the Examiner.
3) Check if the number on (i) your table (ii) answer book and (iii) the containers A, B,C and D are the same. If not, report immediately to the Examiners.
4) Use of non - programmable calculator is allowed.

Atomic Masses:- H=1, C=12, N=14, O=16, S=32, K=39, Mn=55, Fe= 56.

SECTION – I

Q.1 You are provided with two solutions as follows:-

Container A:_____N/M stock solution of hydrated Oxalic acid / Mohr's salt.

Container B: $KMnO_4$ Solution

Using the stock solution from Container A, prepare 100 mL of _____N/M hydrated Oxalic acid /Mohr's salt in the given Standard Measuring flask C.

Using the solution prepared in flask C, determine N/M of the solution in container B.

Also calculate.(any one)

• The strength of the solution in container B in terms of grams per _____mL.

• The percentage purity of the solution in container B, _____g of which have been dissolved per _____mL. (08 Marks)

Q.2 Journal + Viva (1+1 Marks)

SECTION – II

Q.3 Analyse the inorganic salt given in container **D** bearing your table number qualitatively and detect the cation and anion present. Give a complete report of all the tests performed. Write the formula of the compound detected. (10 Marks)

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GOA BOARD OF SECONDARY & HIGHER SECONDARY EDUCATION Alto, Betim – Goa

HIGHER SECONDARY SCHOOL CERTIFICATE EXAMINATION

GUIDELINES FOR CONDUCT OF THE H.S.S.C. PRACTICALS IN CHEMISTRY -2026-27

1 Student should report in journal:

(a) Minimum of 4 volumetric exercises.

(b) Minimum 10 inorganic qualitative analysis.

(c) Minimum **Five Activities** .

2 **List of the compounds**.

COMPOUND	***COMPOUND***
NH_4Cl	$Zn(NO_3)_2$
NH_4Br	**$ZnCl_2$**
$(NH_4)_3PO_4$	$CoCl_2$
$(NH_4)_2CO_3$	**$CoSO_4$**
$Pb(NO_3)_2$	$Co(NO_3)_2$
$Pb(CH_3COO)_2$	**$CaCl_2$**
$CuSO_4$	$Ca(NO_3)_2$
$CuCl_2$	**$Sr(NO_3)_2$**
$Cu(NO_3)_2$	$SrCl_2$
$AlCl_3$	**$BaCl_2$**
$Al_2(SO_4)_3$	$Ba(NO_3)_2$
$Al(NO_3)_3$	**$MgSO_4$**
$FeCl_3$	$MgCl_2$
$Fe(NO_3)_3$	**KCl**
$MnCl_2$	KI
$MnSO_4$	**KBr**
$NiSO_4$	K_2SO_4
$NiCl_2$	**K_2CO_3**
$Ni(NO_3)_2$	K_3PO_4
$ZnSO_4$	**$K_2C_2O_4$**

2026-27

1. Scheme for allotment of marks.

Q1. In organic Volumetric Analysis (Redox titration) (8 marks)

(a) Correct observations (burette solution, solution in the flask, indicator and colour change) (1 mark)
(b) Calculation of correct volume ..... (1 mark)
(c) Range of titre reading for allotment of marks is as follows: (Maximum 4 marks)

Error in titre reading	Marks
±0.2mL	4
±0.3mL	**3**
±0.4mL	2
±0.5mL	**1**

Pilot reading and a set of three concordant reading shall be recorded in the observation table and thus the concordant reading should be taken as the correct reading for assigning the marks for accuracy in the reading.

(d) Calculations:- (2 marks)

(1) Calculation of N/M of solution in container B,by using

(1)$N_1V_1=N_2V_2$ (2)N=aM

$a_1M_1V_1=a_2M_2V_2$formula/e, (a= number of electrons lost or gained per molecule)..... (1 mark)

(2) Calculate the following..... (1 mark)

Strength of the solution in container B in terms of_____g/_____mL
Or % purity of solution in container B

N.B. *In case the titre reading is not within the range of error then for calculations (correct formula) ½ mark to be allotted out of the 1 mark allotted for each calculation.*

Q 2. JOURNAL+Viva **(2 Mark)**

The marks are to be allotted as follows:
a. For the experiments performed and recorded during the year. (1 mark)
b. Viva on volumetric analysis *(Two questions ½ marks each)* (1 mark)

Q 3. Qualitative analysis of Inorganic Compound **(10 marks)**

Dry/PreliminaryTests ..... (4 marks)	**WET TESTS FOR CATION…..(3 marks)**
Colour.....(½ mark) Heating in a dry test tube……..(½ mark) Flame test ……..…(½ mark) Test for NH_4^+ ……. ……(½ mark) Dil HCI test..... (½ mark) Conc H_2SO_4.....(½ mark) Phosphate test ……..…(½ mark) $KMnO_4$test……..……(½ mark) If no anion is detected and if it is SO_4^{-2}, it need not be reported as given in the chart.	1) Group separation.....(1 mark) 2) Identification of cation ……..…(1 mark) 3) C.T. for cation……(1 mark) **WET TESTS FOR ANION AND RESULT..... (2 marks)** (1) Identification of anion……..(1 mark) (2) C.T. for anion……. (1 mark) **(3) CORRECT FORMULA OF SALT** **…**..... (1 mark)

****

Assessment criteria for internal assessment of 20 marks

1. **Five different activities to be performed out of the 10 activities listed below.**

   Two marks each for reporting 5 activities in the journal. Total of 10 marks to be allotted for the same.

   - **Preparation of dyes.**
   - **Preparation of coordination compounds.**
   - **Effect of concentration on the rate of reaction.**
   - **Effect of temperature on the rate of reaction.**
   - **Enthalpy of neutralisation.**
   - **Setting up of Daniel cell.**
   - **Setting up of electrolytic cell.**
   - **Chalk chromatography.**
   - **Preparation of Tollen's reagent and Iodoform.**
   - **Detection of functional group (tests to distinguish between Alcoholic and Phenolic group, Phenolic and Amino group, Ketonic and aldehydic group)**

2. **Innovative methods (any one topic 10 marks).**

   Suggestive topics for innovative methods.

   - **Investigatory project.**
   - **Working/static model.**
   - **Visit to industrial units.**
   - **Survey.**
   - **Poster based assignment.**
   - **Power point presentation.**

   NOTE: Student should submit a hand written report and the same to be evaluated as per the marking scheme given below.

   - **Submission of report – 5 marks.**
   - **Method adopted - 3 marks.**
   - **Viva - 2 marks**

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2026-27