



*Sample Paper
&
Question Paper Pattern*

2022
2023

GOA BOARD

GOA BOARD OF SECONDARY AND HIGHER SECONDARY EDUCATION

CLASS: XII SUBJECT: CHEMISTRY

SCHEME OF EXAMINATION AND MARKS DISTRIBUTION (2022- 23)

No	Unit	1 st Internal Test, Aug.	2 nd Internal Test, Oct .	1 st Term Exam, Nov/Dec, Board.	3 rd * Internal Test, By Mid Feb	2 nd Term Exam, Mar/Apr, Board.
1	THE SOLID STATE	5±1		4±1		
2	SOLUTIONS		4±1	5±1		
3	ELECTROCHEMISTRY					5±1
4	CHEMICAL KINETICS	5±1		5±1		
5	SURFACE CHEMISTRY					4±1
6	GENERAL PRINCIPLES AND PROCESSES OF ISOLATION OF ELEMENTS					4±1
7	THE P-BLOCK ELEMENTS		5±1	6±1		
8	THE d-&f-BLOCK ELEMENTS					5±1
9	COORDINATION COMPOUNDS					4±1
10	HALOALKANES & HALOARENES	7±1		5±1		
11	ALCOHOLS, PHENOLS AND ETHERS		4±1	5±1		
12	ALDEHYDES, KETONES AND CARBOXYLIC ACIDS					6±1
13	AMINES		4±1	4±1		
14	BIOMOLECULES		3±1	3±1		
15	POLYMERS					2±1
16	CHEMISTRY IN EVERYDAY LIFE	3±1		3±1		
	INNOVATIVE TESTING				10	
	PRACTICAL-FIRST TERM				10	
	MAXIMUM MARKS	20	20	40	20	30
	DURATION IN MINUTES	60	60	90		90
	NUMBER OF QUESTIONS	10	10	40		20
	MULTIPLE CHOICE QUESTION (1MARK)	2		40		
	VERY SHORT ANSWER VSA (1 MARK)	2				12
	SHORT ANSWER I (SA I)—2 MARKS	3				6
	SHORT ANSWER (SA II)—3 MARKS	2				2
	LONG ANSWER (LA) —4 MARKS	1				---
	KNOWLEDGE %	30 ±5		20±5		30 ±5
	UNDERSTANDING %	40±5		40±5		40±5
	SKILL %	10±5				10±5
	APPLICATION %	20 ±5		40±5		20 ±5
	DIFFICULTY					
	LEVEL %					
	EASY	30±5		20±5		30±5
	AVERAGE	50±5		40±5		50±5
	DIFFICULT	20±5		40±5		20±5

FIRST TERM PRACTICAL

VOLUMETRIC ANALYSIS	06 marks
DETECTION OF FUNCTIONAL GROUP	02 marks
JOURNAL + VIVA	02 marks
TOTAL	10 marks
DURATION	90 minutes

YEAR END PRACTICAL.

VOLUMETRIC ANALYSIS	07 marks
INORGANIC COMPOUND	10 marks
JOURNAL + VIVA	2+1=3 marks
TOTAL	20 marks
DURATION	150 minutes

COMPUTATION OF TOTAL MARKS

First-Term	Second-Term	Quarterly Evaluation(Internal)	Practical	Total
40	30	60÷6=10	20	100

*Innovative Method.

GOA BOARD OF SECONDARY AND HIGHER SECONDARY EDUCATION

ALTO - PORVORIM, GOA.

MODEL QUESTION PAPER (2022-23)

BLUEPRINT

STANDARD XII SCIENCE SUBJECT: CHEMISTRY

EXAM: FIRST TERM Marks: 40 Duration: 90 Mins. (5400s)

	OBJECTIVES				DIFFICULTY LEVEL		
	K	U	A		Easy (E)	Average (Av)	Difficult (D)
Percentage	20	40	40		20	40	40
Marks	8	16	16		8	16	16

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

Type of questions	Marks	No. of questions	Total Marks
MCQ	1	40	40

MCQ= MULTIPLE CHOICE QUESTION

Q.No.	Unit No. and Name	Objective	Difficulty Level	Duration(s)
1	16. Chemistry in Everyday life	K	E	15
2	14. Biomolecules	U	Av	20
3	2. Solutions	U	Av	20
4	1. Solid state	K	E	15
5	16. Chemistry in Everyday life	K	E	15
6	10. Haloalkanes and Haloarenes	U	Av	40
7	11. Alcohols, Phenols and Ethers	A	D	300
8	4. Chemical kinetics	U	Av	40
9	7.p-block Elements	U	Av	20
10	13. Amines	U	Av	60
11	16. Chemistry in Everyday life	U	Av	20
12	2. Solutions	K	E	15
13	10. Haloalkanes and Haloarenes	A	D	300
14	13. Amines	U	Av	60
15	7.p-block Elements	K	E	15
16	4. Chemical kinetics	A	D	300
17	1. Solid state	U	Av	20
18	11. Alcohols, Phenols and Ethers	A	D	300
19	14. Biomolecules	K	E	15
20	13. Amines	A	D	300

21	10. Haloalkanes and Haloarenes	U	Av	60
22	7.p-block Elements	A	D	180
23	11. Alcohols, Phenols and Ethers	A	D	300
24	2. Solutions	U	Av	40
25	4. Chemical kinetics	U	Av	60
26	10. Haloalkanes and Haloarenes	A	D	300
27	7.p-block Elements	K	E	15
28	13..Amines	U	Av	60
29	1. Solid state	A	D	300
30	4. Chemical kinetics	K	E	15
31	7.p-block Elements	U	Av	60
32	4. Chemical kinetics	A	D	300
33	2. Solutions	A	D	300
34	1. Solid state	A	D	90
35	11. Alcohols, Phenols and Ethers	A	D	300
36	10. Haloalkanes and Haloarenes	U	Av	60
37	7.p-block Elements	A	D	180
38	2. Solutions	A	D	300
39	11.Alcohols, Phenols and Ethers	A	D	300
40	14. Biomolecules	U	Av	20
TOTAL DURATION (s)				5130

**GOA BOARD OF SECONDARY AND HIGHER SECONDARY EDUCATION
ALTO - PORVORIM, GOA.**

Model Question Paper

XII SCIENCE

CHEMISTRY

SUBJECT CODE: H-703

Exam: First Term

(2022-23)

Maximum Marks: 40

Number of questions: 40

No. of pages: 6

Duration: 90 Mins.

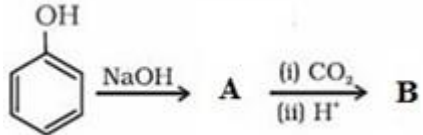
INSTRUCTIONS:

1.	The question paper consists of 40 Multiple Choice Questions, each carrying one mark.
2.	Each question has four choices (A), (B), (C) and (D) for its answer, of which only one is correct.
3.	On the OMR sheet provided to you, for each question number, darken with a blue or black ball point pen, ONLY ONE bubble corresponding to what you consider to be the most appropriate answer, from among the four choices.
4.	Please note that it is not possible to change the answer once you have filled up the bubble with the ball point pen. Hence sufficient care has to be taken while darkening the bubble.
5.	For each question, you will be awarded ONE mark, if you have darkened only one bubble corresponding to the correct answer. In all other cases, you will get zero. There is no negative marking.
6.	Only one OMR sheet will be provided.
7.	In numerical problems, choose the option closest to the correct answer.

Q.1	Among the following, a bacteriostatic antibiotic is----- A) Erythromycin B) Penicillin C) Ofloxacin D) Streptomycin
Q.2	Glucose contains in addition to aldehydic group..... A) 3 primary OH groups & 2 secondary OH groups. B) 1 primary OH group & 4 secondary OH groups. C) 2 primary OH groups & 3 secondary OH groups. D) 1 primary OH group & 5 secondary OH groups.
Q.3	Effect of temperature on the Osmotic Pressure of a solution is _____ A) It decreases with an increase in temperature. B) It decreases very slowly with an increase in temperature C) There is no effect of temperature. D) It increases with an increase in temperature
Q.4	Dry ice is an example of _____ A) ionic solid B) covalent solid C) molecular solid D) metallic solid
Q.5	----- is added to shaving soaps to prevent rapid drying. A) Rosin B) Ethanol C) Glycerol D) Borax

Q.6	An example of a geminal dihalide from the following is A) $\text{CH}_2(\text{Br})\text{CH}_2(\text{Br})$ B) $\text{CH}_3\text{C}(\text{Br})_2\text{CH}_3$ C) $\text{CH}_2(\text{Br})\text{CH}(\text{Br})\text{CH}_3$ D) $\text{CH}_3\text{CH}(\text{Br})\text{CH}_2(\text{Br})$
Q.7	Among the following ether, one which will produce methyl alcohol on treatment with hot conc. HI is _____. A) sec-butyl methyl ether. B) tert-butyl methyl ether. C) iso-butyl methyl ether. D) butyl methyl ether
Q.8	For a first order reaction the graph of $\log [R]$ v/s time has slope equal to _____. A) $-k$ B) $-k/2.303$ C) $-2.303k$ D) 0
Q.9	Rhombic sulphur consists of _____. A) S_4 molecule B) S_6 molecule C) S_8 molecule D) S_2 molecule
Q.10	Carbylamine test can be used to distinguish between _____. A) Aniline and N-methylaniline B) Aniline and Methylamine C) Aniline and Benzylamine D) Aniline and 2,4-Dimethylaniline
Q.11	Artificial sweetener which cannot be added to hot foods is _____. A) Sucrose B) Aspartame C) Saccharin D) Alitame
Q.12	The law which indicates the relationship between solubility of a gas in liquid and pressure is A) Raoult's law B) Henry's law C) Boyle's law D) Dalton's law
Q.13	An optically active halide when allowed to react with CN^- gives a racemic mixture due to the formation of A) free radical B) transition state via $\text{S}_\text{N}2$ mechanism. C) carbocation via $\text{S}_\text{N}2$ mechanism D) carbocation via $\text{S}_\text{N}1$ mechanism
Q.14	Hoffmann bromamide degradation of Butanamide yields _____. A) Butan-1-amine B) Propan-1-amine C) Butan-2-amine D) Propan-2-amine

Q.15	Shape of XeF_4 is _____ A) Square planar B) Linear C) Octahedral D) Tetrahedral
Q.16	For a first order reaction the rate doubles when the temperature is raised from 20°C to 35°C . ($R=8.314\text{J/K/mol}$) The activation energy for the reaction is----- A) 269 KJ/mol B) 34.7 KJ/mol C) 15.1 KJ/mol D) 342 KJ/mol
Q.17	_____ shows maximum packing efficiency A) Body centered cubic unit cell B) Hexagonal close packing C) Simple cubic unit cell D) Square close packing
Q.18	Isobutyl alcohol is prepared from the reaction of _____ A) $\text{CH}_3\text{CH}_2\text{MgBr}$ and CH_3CHO B) CH_3MgBr and $\text{CH}_3\text{CH}_2\text{CHO}$ C) $(\text{CH}_3)_2\text{CHMgBr}$ and HCHO D) CH_3MgBr and CH_3COCH_3
Q.19	Deficiency of Vitamin _____ causes bleeding of gums. A) B1 B) B2 C) C D) K
Q.20	Aniline reacts with nitrous acid at a low temperature to give compound A , compound A when coupled with Phenol gets converted to compound B . Compound B is ----- A) p-Aminoazobenzene B) p-Hydroxyazobenzene C) p-Nitroazobenzene D) p-Methoxyazobenzene
Q.21	The C - Cl bond of chlorobenzene in comparison to C-Cl bond in methyl chloride is _____ A) longer, weaker and can cleave easily. B) shorter, weaker and can cleave easily. C) shorter, stronger and cannot cleave easily. D) longer, stronger and cannot cleave easily.
Q.22	The reducing character of hydrides of group 15 elements _____. A) Increases from top to bottom B) Decreases from top to bottom C) Remains same D) First increases then decreases

Q.23	 A) A= Sodium phenoxide B = 4- Hydroxybenzoic acid B) A= Sodium methoxide B = Salicylaldehyde C) A= Sodium phenoxide B = 2- Hydroxybenzoic acid D) A= Sodium phenoxide B = Picric acid
Q.24	Electrolyte that has the same value of Van't Hoff factor 'i' as that of Aluminium sulphate if all undergo complete dissociation is _____ A) $\text{Al}(\text{NO}_3)_3$ B) $\text{K}_3[\text{Fe}(\text{CN})_6]$ C) $\text{K}_4[\text{Fe}(\text{CN})_6]$ D) K_2SO_4
Q.25	If the rate of disappearance of SO_2 in the following reaction $2\text{SO}_2 + \text{O}_2 \rightarrow 2\text{SO}_3$ is $1.28 \times 10^{-3} \text{ g/sec}$ then the rate of formation of SO_3 is _____ A) $0.64 \times 10^{-3} \text{ g/sec}$ B) $0.80 \times 10^{-3} \text{ g/sec}$ C) $1.28 \times 10^{-3} \text{ g/sec}$ D) $1.60 \times 10^{-3} \text{ g/sec}$
Q.26	An unknown alkyl halide 'A' reacts with alcoholic KOH to produce a hydrocarbon having formula C_4H_8. Ozonolysis of this hydrocarbon and further decomposition with zinc and water gives one mole of propionaldehyde and one mole of formaldehyde. Compound from the following which is the correct structure of the above alkyl halide 'A' is A) $\text{CH}_3(\text{CH}_2)_3\text{Cl}$ B) $\text{CH}_3\text{CH}(\text{Cl})\text{CH}(\text{Cl})\text{CH}_3$ C) $\text{CH}_3\text{CH}_2\text{CH}(\text{Cl})\text{CH}_3$ D) $\text{Cl}(\text{CH}_2)_4\text{Cl}$
Q.27	Sulphuric acid is manufactured by _____ A) Haber's process B) Contact process C) Ostwald's process D) Dow's process
Q.28	Among the following compounds, the one with the highest pK_b value is A) Ethyl amine B) Ammonia C) Trimethylamine D) Aniline
Q.29	An element having bcc geometry has atomic mass 50 and edge length is 290 pm. The density of unit cell is A) 68.1 g/cm^3 B) 6.81 g/cm^3 C) 1.86 g/cm^3 D) 8.16 g/cm^3
Q.30	Statement from the following which is not true regarding catalysts is A) Does not alter the equilibrium in a reversible reaction. B) Sometimes specific in terms of reaction. C) Can change enthalpy of reaction. D) Can change activation energy of the reaction.

Q.31	Oxidation number of the phosphorus in Pyrophosphoric acid is_____. A) 1 B) 3 C) 4 D) 5
Q.32	A first order reaction is half completed in 45 min, time taken for 99.9% of the reaction to be completed is_____. A) 5 hrs B) 7.5 hrs C) 10 hrs D) 20 hrs
Q.33	When three moles of Component 'P' and two moles of Component 'Q' are mixed ideally, total Vapour pressure of the solution will be_____. if Vapour Pressure of pure Component 'P' and Component 'Q' are 80 torr and 60 torr respectively. A) 72 torr B) 140 torr C) 70 torr D) 80 torr
Q.34	When Sodium chloride is crystallised with a little amount of Strontium chloride, then it_____. A) Creates anionic vacancy B) Appears amorphous C) Creates cationic vacancy D) Creates metal deficiency
Q.35	In the following compounds o- nitrophenol, m- nitrophenol, p- nitrophenol and phenol the most acidic compound (A) and the least acidic compound (B) are_____. A) A= o- nitrophenol B= m- nitrophenol B) A= m- nitrophenol B= p – nitrophenol C) A= p – nitrophenol B = phenol D) A= o-nitrophenol B = p- nitrophenol
Q.36	Most suitable reaction for the preparation of ethylbenzene is_____. A) Friedel Craft's acylation B) Wurtz Reaction C) Wurtz - Fittig reaction D) Fittig reaction
Q.37	Bleaching action of chlorine is due to_____. A) Hydration B) Oxidation C) Reduction D) Ionisation
Q.38	Elevation in boiling point of an aqueous solution containing a non- electrolytic solute is 1.04 K . Depression in freezing point of this solution is_____. Given $K_b(\text{H}_2\text{O}) = 0.52 \text{ K Kg mol}^{-1}$ and $K_f(\text{H}_2\text{O}) = 1.86 \text{ K Kg mol}^{-1}$ A) 1.86 K B) 0.93 K C) 0.52 K D) 3.72 K

Q.39	The most appropriate set of reactants for the preparation of 1-Methoxybenzene is A) C_6H_5Br and CH_3ONa B) C_6H_5ONa and CH_3Br C) C_6H_5OH and CH_3Br D) C_6H_5Br and CH_3OH
Q.40	Structural changes that occur when an egg is boiled, A) Only 1° structure is destroyed. B) 2° & 3° structures are destroyed but 1° structure remains intact. C) 1° , 2° & 3° structures are destroyed. D) 2° & 3° structures remain intact but 1° structure is destroyed.

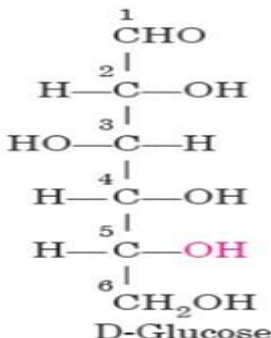
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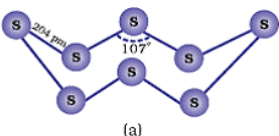
**GOA BOARD OF SECONDARY AND HIGHER SECONDARY EDUCATION
ALTO - PORVORIM, GOA.**

XII SCIENCE	CHEMISTRY	SUBJECT CODE: H-703
Exam: First Term	(2022-23)	Maximum Marks: 40
Number of questions: 40	No. of pages:	Duration: 90 Mins.

Answer key

Enter your correct option here (Provide additional information/solution if required)

Q.1	A
Q.2	B  D-Glucose
Q.3	D
Q.4	C Dry ice is solid carbon dioxide which is generally used in packing frozen items is an example of molecular solid.
Q.5	C
Q.6	B
Q.7	B
Q.8	B

Q.9	C Rhombic sulphur consists of S₈ molecule that is puckered or crown shaped.  (a)
Q.10	A
Q.11	B
Q.12	B
Q.13	D
Q.14	B
Q.15	A XeF₄ has a square planar shape with dsp² hybridisation
Q.16	B
Q.17	B Packing efficiency is maximum in case of Hexagonal close packing that is 74% and least space occupied is in simple cubic unit cell which is 52%.
Q.18	C
Q.19	C
Q.20	B
Q.21	C
Q.22	A The reducing character of hydrides of group 15 elements increases from top to bottom because the strength of E-H (Here E= N, P, As, Sb, or Br) bond decreases down the group due to increase in the size of central atom
Q.23	C
Q.24	C On complete dissociation, one molecule of Aluminium sulphate produces five ions i.e. $\text{Al}_2(\text{SO}_4)_3 \rightarrow 2 \text{Al}^{+3} + 3 \text{SO}_4^{-2}$ (two aluminium ions and three sulphate ions) Only K₄[Fe(CN)₆] will give 5 ions. i.e. $\text{K}_4[\text{Fe}(\text{CN})_6] \rightarrow 4 \text{K}^{+1} + [\text{Fe}(\text{CN})_6]^{-4}$
Q.25	C

	No of moles of reactant ie SO_2 is same as no of moles of products formed ie SO_3 therefore the rate of disappearance of SO_2 is same as rate of appearance of product SO_3
Q.26	A 1-chlorobutane + alc. KOH $\rightarrow$ But-1-ene i.e C_4H_8 and But-1-ene + $\text{O}_3 \rightarrow$ Ozonide. Ozonide of But-1-ene + $\text{Zn}/\text{H}_2\text{O} \rightarrow$ propionaldehyde + formaldehyde.
Q.27	B
Q.28	D Higher the pK_b value, weaker is the base
Q.29	B
Q.30	C
Q.31	D Ans: The oxidation number of phosphorus in Pyrophosphoric acid is +5. Explanation The total number of electrons that an atom either gains or loses to form a chemical bond with another atom is known as the oxidation number. Pyrophosphoric acid is a tetraprotic acid with the formula $\text{H}_4\text{P}_2\text{O}_7$. Pyrophosphoric acid $\text{H}_4\text{P}_2\text{O}_7$ Let oxidation state of phosphorus is x $(4 \times 1 + (-2) \times 7 + 2x) = 0$ $2x = 10$ $x = +5$
Q.32	B

	$t = \frac{2.303}{k} \log \left[\frac{100}{0.1} \right]$ $t = \frac{2.303}{0.0154} \log 1000$ $t = \frac{2.303}{0.0154} \times 3 = 448.636 \text{ minutes}$ $t = 7 \frac{3}{10} \text{ hours.}$ Approx = 7.5 hours
Q.33	A $P_{\text{total}} = P_P + P_Q \text{ or } P = P_P^0 X_P + P_Q^0 X_Q$ Thus $X_P = 3/5 = 0.6$ and $X_Q = 2/5 = 0.4$ Hence $P_{\text{total}} = 80 \times 0.6 + 60 \times 0.4 = 72 \text{ torr.}$
Q.34	C Ans: Creates cationic vacancy Each Sr^{2+} replaces two Na^+ ions. Sr^{2+} occupies the site of one of the Na^+ ions and the other site remains vacant.
Q.35	C
Q.36	C
Q.37	B Bleaching action of chlorine is due to oxidation $\text{Cl}_2 + \text{H}_2\text{O} \rightarrow 2\text{HCl} + \text{O}$ Coloured substance + O $\rightarrow$ Colourless substance
Q.38	D $\Delta T_b = K_b \times m \text{ and } \Delta T_f = K_f \times m$ Also $\Delta T_b / K_b = \Delta T_f / K_f$ Thus $1.04 / 0.52 = \Delta T_f / 1.86$. Hence $\Delta T_f = 1.04 \times 1.86 / 0.52 = 3.72 \text{ K}$
Q.39	B
Q.40	B

*****The End*****

GOA BOARD OF SECONDARY AND HIGHER SECONDARY EDUCATION
ALTO - PORVORIM, GOA.
BLUEPRINT OF SECOND TERM QUESTION PAPER (2022-23)

Q. No.	Unit No. and Name	Objective	Difficulty Level	Duration (s)	Marks
1	6.GENERAL PRINCIPLES & PROCESSES OF ISOLATION OF ELEMENTS	U	E	2	1
2	9.COORDINATION COMPOUNDS	K	E	2	1
3	15.POLYMERS	U	A	2	1
4	9.COORDINATION COMPOUNDS	U	A	3	1
5	5. SURFACE CHEMISTRY	K	E	2	1
6	9.COORDINATION COMPOUNDS	A	D	3	1
7	12. ALDEHYDES, KETONES AND CARBOXYLIC ACIDS	U	A	3	1
8	15.POLYMERS	U	E	2	1
9	8. THE d-& f-BLOCK ELEMENTS	U	A	3	1
10	5. SURFACE CHEMISTRY	U	E	3	1
11	8. THE d-& f-BLOCK ELEMENTS	U	E	3	1
12	8. THE d-& f-BLOCK ELEMENTS	K	E	2	1
13	6.GENERAL PRINCIPLES & PROCESSES OF ISOLATION OF ELEMENTS	U,S	A	6	1+1=2
14	5. SURFACE CHEMISTRY	S	A	6	2
15	9.COORDINATION COMPOUNDS	K	A	6	2
16	8. THE d-& f-BLOCK ELEMENTS	K	E	6	2
17	12. ALDEHYDES, KETONES AND CARBOXYLIC ACIDS	K	A	6	2
18	3.ELECTROCHEMISTRY OR	A	D	6	2
18	3.ELECTROCHEMISTRY	A	D		2
19	3.ELECTROCHEMISTRY	U	A	6	3
20	12. ALDEHYDES, KETONES AND CARBOXYLIC ACIDS OR	A	D	8	3
20	12. ALDEHYDES, KETONES AND CARBOXYLIC ACIDS	A	D		3
TOTAL DURATION (mins) & Marks				80	30

ALTO - PORVORIM, GOA.

-----**Model Question Paper**-----

SUBJECT CODE: H-703

Maximum Marks: 30

Duration: 90 Mins.

1. All questions are compulsory, however question number 18 and 20 have internal choice.
 - i. Questions one to twelve carry 1 mark each.
 - ii. Questions thirteen to eighteen carry 2 marks each.
 - iii. Questions nineteen and twenty carry 3 marks each
2. Each question should be attempted only once.
3. Use of calculator is not permitted, however logarithmic table will be provided on request.

Q.1.	Name the method which is used for the purification of germanium, silicon and gallium used in semiconductors.	1
Q.2.	When $[\text{Cu}(\text{NH}_3)_4]\text{Cl}_2$ is dissolved in water how many ions are produced ?	1
Q.3.	Given one example each of (i) addition polymers, (ii) condensation polymers,	1
Q.4.	What is the role of each of the following in froth floatation process (i) Collectors (ii) Froth stabilizers	1
Q.5.	Name the following: a) Enzyme that catalyses conversion of maltose into glucose. b) The process of converting precipitate into colloidal solution.	1
Q.6.	Write the IUPAC name for the following compound. $[\text{Cu}(\text{NH}_3)_4][\text{CuCl}_4]$	1
Q.7.	An organic compound with molecular formula $\text{C}_5\text{H}_{10}\text{O}$ gives positive iodoform test and negative Fehling's test. Write the structure and name of the compound.	1
Q.8.	What are biodegradable polymers?	1
Q.9.	In which of the following pairs both the ions are coloured in aqueous solution? i) Ni^{+2} and Cu^{+1} ii) Sc^{+3} and Ti^{+3} iii) Sc^{+3} and Ti^{+3} iv) Ni^{+2} and Ti^{+3}	1
Q.10.	State the principle involved in the following statement. "sky appears blue in colour"	1
Q.11.	Amongst potassium permanganate and potassium manganate write which one is paramagnetic with reason.	1
Q.12.	Write the general electronic configuration of Lanthanoids and Actinoids.	1
Q.13.	Name the process by which Haematite and Magnetite ores can be concentrated, Also draw a diagram of this process.	2

Q.14.	Draw the graph to verify Freundlich adsorption isotherm. Label the intercept on the y axis and the slope in the graph.	2								
Q.15.	With the help of VBT deduce the geometry of $[\text{Ni}(\text{CN})_4]^{-2}$	2								
Q.16.	Name the following. a) Alloy of Transition element with non-transition element. b) Interstitial compound of Fe c) Hardest element in transition series. d) Transition element having oxidation state 8	2								
Q.17.	Write chemical equations for the following conversions i) Methylmagnesium bromide to Ethanoic acid ii) Benzene to acetophenone.	2								
Q.18.	Solutions of two electrolytes 'A' and 'B' are diluted. The Λ_m of 'B' increases 1.5 times while that of 'A' increases 25 times. i) Which of the two electrolytes is a Strong electrolyte? Justify your answer. ii) In the equation, $\Lambda_m = \Lambda^0_m - Ac^{1/2}$, state the significance of the value of the constant 'A'.	2								
	OR Three iron sheets have been coated separately with three metals X,Y and Z whose standard reduction potentials are given below. <table border="1"><tr><td>X</td><td>Y</td><td>Z</td><td>Fe</td></tr><tr><td>- 0.76 V</td><td>- 0.20 V</td><td>- 0.66 V</td><td>- 0.44 V</td></tr></table> i) Identify in which case rusting will take place faster when the coating is damaged. ii) Arrange metals X , Y and Z in the decreasing order of their reducing power.	X	Y	Z	Fe	- 0.76 V	- 0.20 V	- 0.66 V	- 0.44 V	
X	Y	Z	Fe							
- 0.76 V	- 0.20 V	- 0.66 V	- 0.44 V							
Q.19.	Calculate the cell emf and ΔG for the given cell at 298 K . $\text{Zn}_{(s)} / \text{Zn}^{+2} (0.0004\text{M}) // \text{Cd}^{+2} (0.2\text{M}) / \text{Cd}_{(s)}$ Given $E^\circ_{\text{Zn}^{+2}/\text{Zn}} = -0.763\text{V}$, $E^\circ_{\text{Cd}^{+2}/\text{Cd}} = -0.403\text{V}$ at 298 K , $F= 96,500\text{ C/mol}$, $R = 8.314\text{ J/K/mole}$.	3								
Q.20.	Answer the following. i) Write the structure of the product formed when Propanoic acid is treated with bromine in the presence of red Phosphorus, followed by hydrolysis. Name the reaction. ii) Write the chemical equation for the action of dilute alkali on Propanone followed by heating. iii) From the following write the one which is most reactive towards nucleophilic addition reaction and one which is least reactive towards nucleophilic addition reaction	3								

CH₃CHO, CH₃COCH₃, CH₃CHO, HCHO

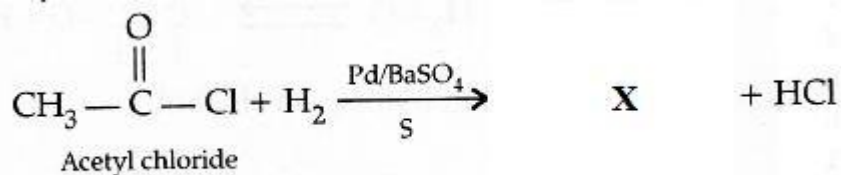
OR

Q.20.

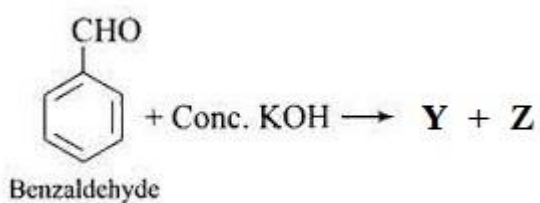
Answer the following

3

- i) Write the structure of compound 'X' and name the reaction



- ii) Write the names of compound 'Y' and 'Z' formed in the following reaction.



- iii) From the following write the one which is most acidic and one which is least acidic.

ClCH₂COOH, CH₃COOH, ClCH₂CH₂COOH, CH₃CH₂COOH.

XII SCIENCE
Exam: Second Term
Total No. of questions: 20

CHEMISTRY
Answer Key (2022-23)
Printed pages: 3

SUBJECT CODE: H-703
Maximum Marks: 30
Duration: 90 Mins.

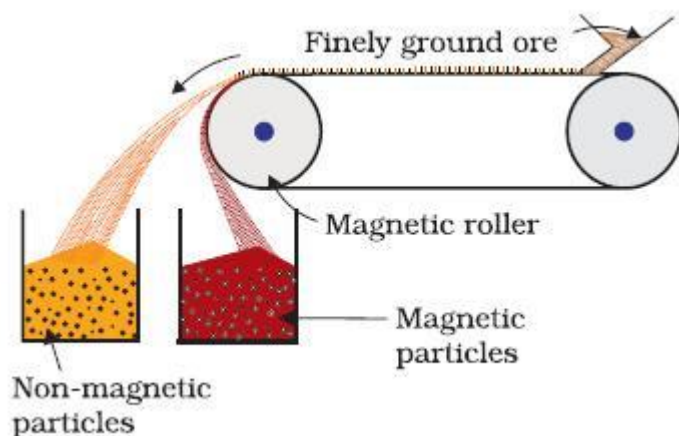
INSTRUCTIONS:

1. All questions are compulsory, however question number 18 and 20 have internal choice.
 - i. Questions one to twelve carry 1 mark each.
 - ii. Questions thirteen to eighteen carry 2 marks each.
 - iii. Questions nineteen and twenty carry 3 marks each
2. Each question should be attempted only once.
3. Use of calculator is not permitted, however logarithmic table will be provided on request.

Q.1.	Zone refining .		1
Q.2.	Three.		1
Q.3.	Type of polymer	Example	1
	(i)Addition polymers	Polyethene or Polythene or PAN, Polystyrene, PVC	
	(ii)Condensation polymers	Nylon 6,6 / Terylene	
Q.4.	Collectors- They increase the non-wettability of mineral particles. Forth stabilizers- They are used to stabilize the froth formed		1
Q.5.	a) Maltase b) peptization		1
Q.6.	Tetraamminecopper(II)tetrachloridocuperate(II)		1
Q.7.	CH ₃ COCH ₂ CH ₃ -----½ mk Pentan-2-one or Methyl n-propyl ketone ----- ½ mk		1
Q.8.	A polymer that can be decomposed by bacteria is called a biodegradable polymer.		1
Q.9.	Ni ⁺² and Ti ⁺³		1
Q.10.	Tyndall effect. Due to the scattering of light by colloidal dust particles present in the air. These dust particles along with water suspended in air scatter blue light.		1
Q.11.	Potassium manganate (K ₂ MnO ₄) is paramagnetic because of one unpaired electron.		1
Q.12.	(n-2)f ⁰⁻¹⁴ (n-1)d ⁰⁻¹ ns ²		1

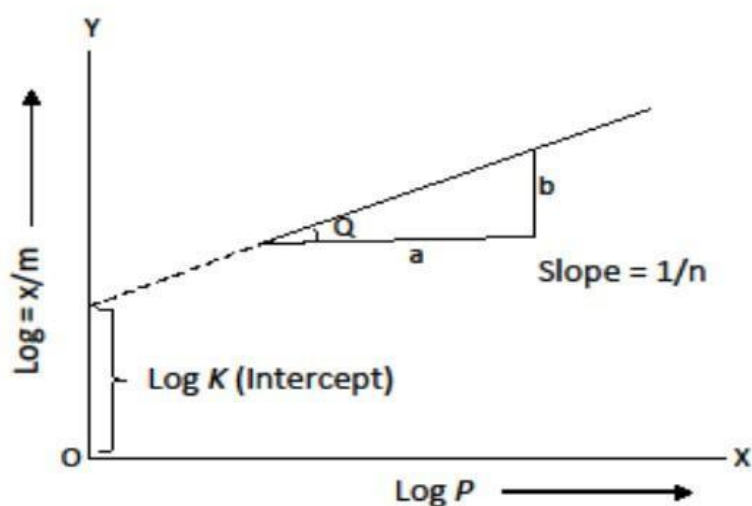
Q.13. Haematite and Magnetite ores can be concentrated by **magnetic separation**.

2



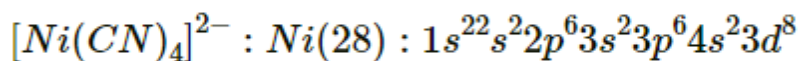
Q.14.

2

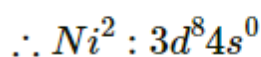


Q.15.

2

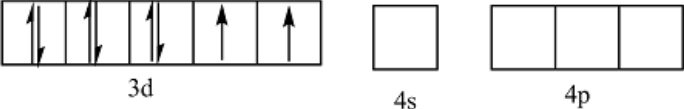
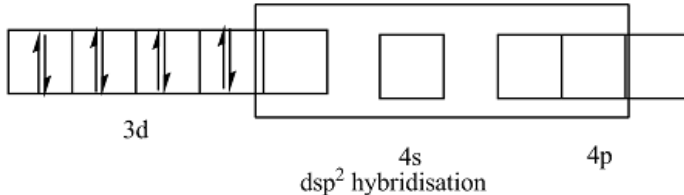
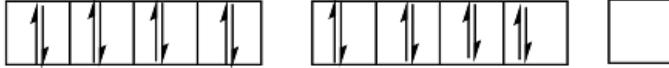
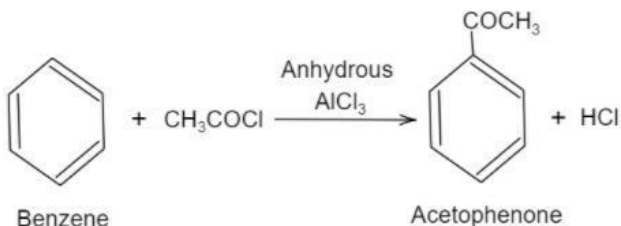


or last shell EC is in $[Ni(CN)_4]^{2-}$, Ni is in +2 state



CN being strong field ligand pairs up the e^{-1} s thus

Ni^{2+} ion with outer electronic configuration $3d^8$ undergoes dsp^2 hybridisation which results in **square planar** geometry.

	Orbitals of Ni^{2+} ions  3d 4s 4p dsp^2 hybridisation  3d 4s 4p $[\text{Ni}(\text{CN})_4]^{2-}$  dsp² hybrid orbitals Four pairs of electrons from 4 cyano groups Since all electrons are paired, the complex is diamagnetic.	
Q.16.	a) Bronze b) Steel c) Tungsten d) Osmium Half mark each	2
Q.17.	1. $\text{O}=\text{C}=\text{O} + \text{CH}_3\text{MgBr} \xrightarrow[\text{ether}]{\text{dry}} \text{CH}_3-\overset{\text{O}}{\underset{\text{O}}{\text{C}}}-\text{OMgBr} \xrightarrow{\text{H}_2\text{O}/\text{H}^+} \text{CH}_3\text{COOH} + \text{Mg} \begin{matrix} \text{OH} \\ \text{Br} \end{matrix}$ dry ice methyl Acetic acid (solid carbon di oxide) magnesium bromide ----1mk 2.  Benzene Acetophenone ----1mk	2
Q.18	i) 'B' is the strong electrolyte as Λ_m for Strong electrolytes decreases to a small extent upon dilution due to total dissociation while that of Weak electrolyte increases to a large extent upon dilution. ii) The value of the constant 'A' for a given solvent and temperature depends on the type of electrolyte i.e the charges on the cation and anion produced upon dissociation of the electrolyte in the solution. Also all electrolytes of a particular type have the same value of 'A'. OR	2

Q.18	i) Rusting will take place sooner with 'Y' when the coating is damaged. as it is above iron in the emf series or the reduction potential of 'Y' is higher than that of iron. ii) Decreasing order of reducing power : $X > Z > Y$	2
Q.19	<u>Calculation of cell emf :</u> According to Nernst equation $E_{\text{cell}} = E^{\circ}_{\text{cell}} - \frac{0.0591}{n} \log \frac{[\text{Zn}^{+2}]}{[\text{Cd}^{+2}]}$ 1/2mk $E^{\circ}_{\text{cell}} = E^{\circ}(\text{Cd}^{+2} / \text{Cd}) - E^{\circ}(\text{Zn}^{+2} / \text{Zn})$ $= (-0.403) - (-0.763) = 0.36 \text{ V}$ 1/2mk $E = (0.36 \text{ V}) - \frac{0.0591}{2} \log \frac{[0.0004]}{[0.2]}$ 1/2mk $E = 0.36 - \frac{0.0591}{2} \times (-2.6990) = 0.36 + 0.08 = 0.44 \text{ V}$ 1/2mk <u>Calculation of ΔG :</u> $\Delta G = -nFE_{\text{cell}}$ 1/2mk $= -(2 \text{ mol}) \times (96500 \text{ C/mol}) \times (0.44 \text{ V}) = -84920 \text{ J}$ 1/2mk	3
Q.20.	i) $\text{CH}_3\text{-CHBr-COOH}$ ----- 1/2mk HVZ or Hell Volhard Zelinsky reaction ----- 1/2 mk ii) $\text{CH}_3\text{COCH}_3 + \text{CH}_3\text{COCH}_3 \xrightarrow{\text{dil OH}^-} (\text{CH}_3)_2\text{C(OH)CH}_2\text{COCH}_3$ ----- 1/2mk $(\text{CH}_3)_2\text{C(OH)CH}_2\text{COCH}_3 \xrightarrow{\Delta} (\text{CH}_3)_2\text{C=CHCOCH}_3$ ----- 1/2mk iii) $\text{C}_2\text{H}_5\text{COCH}_3$ is least reactive ----- 1/2mk HCHO is most reactive ----- 1/2mk OR i) CH_3CHO ----- 1/2 mk Rosenmund reduction ----- 1/2 mk ii) Y/Z is Potassium benzoate Z/Y is Benzyl alcohol or Phenylmethanol iii) $\text{CH}_3\text{CH}_2\text{COOH}$ - least acidic ----- 1/2mk ClCH_2COOH - most acidic ----- 1/2 mk	3

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**BLUEPRINT OF FIRST INTERNAL TEST MODEL QUESTION PAPER (2022
- 2023)**

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

	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 $\pm 5\%$ is permitted in the above Objectives and Difficulty Level

Type of questions	Marks	Number 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 I

SA – II = Short Answer– II

LA = Long Answer.

**GOA BOARD OF SECONDARY AND HIGHER SECONDARY
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BLUEPRINT OF FIRST INTERNAL TEST MODEL QUESTION PAPER (2022 - 2023)

Q. No.	Type	Unit No. and Name	Objectives	Difficulty level	Duration (min)	Marks
1	MCQ	1. THE SOLID STATE	U	E	2	1
2	MCQ	10. HALOALKANES AND HALOARENES	K	E	2	1
3	VSA	4. CHEMICAL KINETICS	K	E	2	1
4	VSA	4.. CHEMICAL KINETICS	S	Av	2	1
5	SA-I	1. THE SOLID STATE	A	D	5	2
6*	SA-I	1. THE SOLID STATE OR	K/S	Av	4	1+1=2
6*	SA-I	1. THE SOLID STATE	K/S	Av	4	1+1=2
7	SA-I	10. HALOALKANES AND HALOARENES	A	D	5	2
8	SA-II	16. CHEMISTRY IN EVERYDAY LIFE	K	E	8	3
9	SA-II	4. CHEMICAL KINETICS	U	Av	8	3
10*	LA	10. HALOALKANES AND HALOARENES OR	U	Av	12	4
10*	LA	10. HALOALKANES AND HALOARENES	U	Av	12	4
	TOTAL DURATION IN MINUTES AND MARKS				50 min	20mks

**Internal choice*

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MODEL QUESTION PAPER

XII SCIENCE
EXAM : 1ST INTERNAL TEST

C H E M I S T R Y
(2022-2023)

MARKS:20
DURATION : 60 min

INSTRUCTIONS :

- i) All questions are compulsory. However Q.Nos. 6 & 10 has internal choice.
- ii) Use logarithm tables for calculations wherever required and not calculators.
- iii) Each question should be attempted only once.
- iv) SECTION A consists of four questions of 1 mark each.
- v) SECTION B consists of three questions of 2 marks each.
- vi) SECTION C consists of two questions of 3 marks each.
- vii) SECTION D consists of one question of 4 marks.

SECTION A		
Q.1	To obtain p-type semiconductor Germanium is doped with impurity. ➤ P ➤ In ➤ Sb ➤ As	1
Q.2	The type of alkyl halide which is most reactive towards S_N1 reaction is-----. ➤ primary ➤ secondary ➤ tertiary ➤ methyl	1
Q.3	Define Molecularity of a reaction.	1
Q.4	Draw a neat labelled graph to show the effect of a catalyst on the activation energy of a reaction.	1
SECTION B		
Q.5	CsCl has a cubic structure of Cl^{-1} ions in which a Cs ion is present in the body centre of the cube. Its density is 3.99 g cm^{-3} . Calculate the edge length of the unit cell. Given atomic mass of Cs= 133 g mol^{-1} and Cl= 35.5 g mol^{-1} , $N_A = 6.022 \times 10^{23}$.	2
Q.6	Answer the following. a) Draw a neat diagram of the defect observed when molten NaCl is	2

	crystallised with a small amount of SrCl_2 . b) Name the type of magnetic property shown by the following substances. i) H_2O ii) MgFe_2O_4	
OR		
Q.6	Answer the following. a) Draw a neat diagram of an ionic solid showing metal excess defect due to anionic vacancy. b) Name the type of solid in which constituent particles exhibit i) Electrostatic forces of attraction ii) Dispersion forces	2
Q.7	Compound A which is a bromoalkane on treatment with KCN gives Compound B with molecular formula $\text{C}_3\text{H}_5\text{N}$. When compound A reacts with AgCN , functional isomer of compound B is obtained. Write the chemical reactions involved and name the compounds A and B .	2
SECTION C		
Q.8	Name the following. 1. A class of chemical compounds used for the treatment of stress and mild or even severe mental diseases. 2. A chemical substance used as food preservative. 3. Process of heating of fat with aqueous sodium hydroxide.	3
Q.9	A first order reaction has a rate constant of 0.0051 min^{-1} . If the initial concentration of the Reactant is 0.01 M , then calculate the following : i) The concentration of the Reactant that will remain in solution after 3 hours. ii) Half life period of the Reactant.	3
SECTION D		
Q.10	Write chemical equations for each of the following and label the major product formed i) Reaction of chlorobenzene with sodium in the presence of dry ether. ii) Action of alcoholic solution of KOH on 2- Bromobutane iii) Action of HBr on But-1-ene in the absence of peroxide. iv) Reaction of Benzene diazonium chloride with potassium iodide.	4
OR		
Q.10	Write chemical equations for each of the following and Name the reaction i) Reaction of Iodoethane with sodium in the presence of dry ether. ii) Reaction of Chlorobenzene with methyl chloride in the presence of anhydrous Aluminium chloride.	4

	iii) Action of NaI on 1-Bromopropane in the presence of dry acetone. iv) Reaction of Benzene diazonium chloride with cuprous bromide.	
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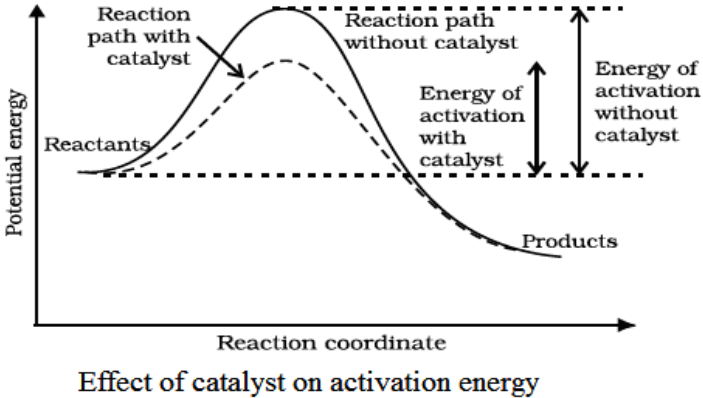
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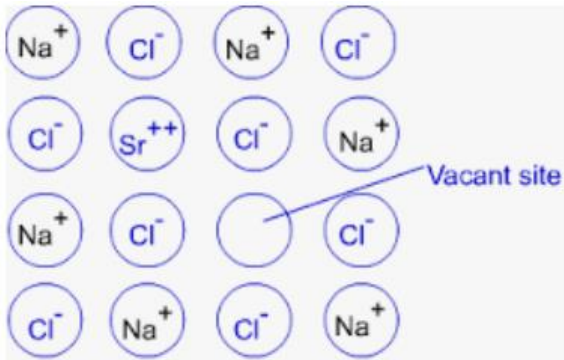
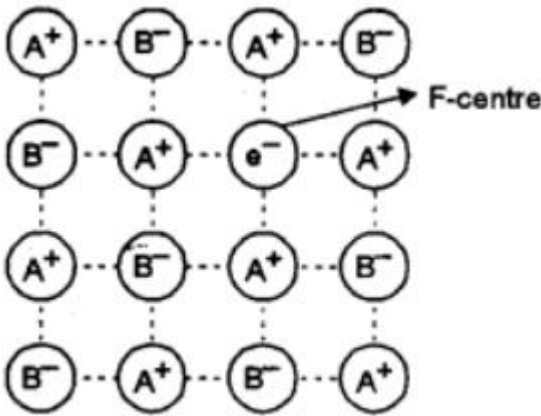
ANSWER KEY TO MODEL QUESTION PAPER OF 1st INTERNAL TEST (2022-2023)

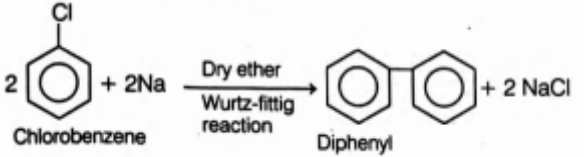
SUBJECT : CHEMISTRY

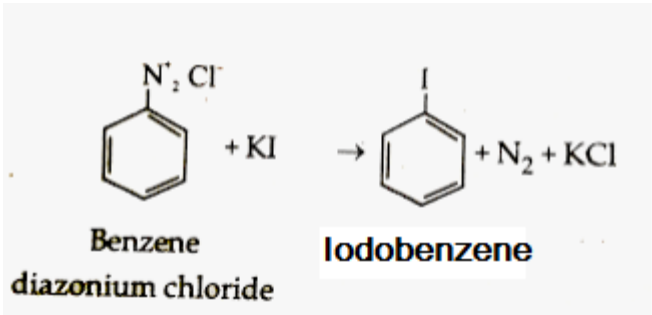
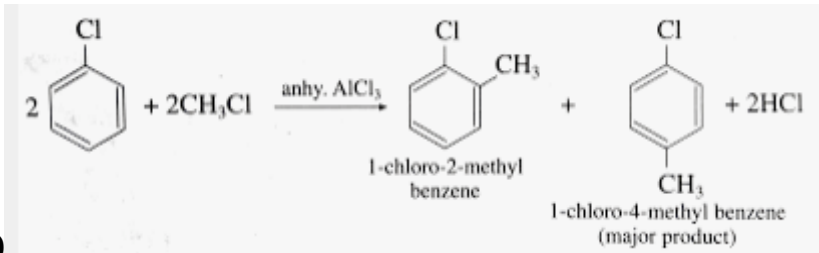
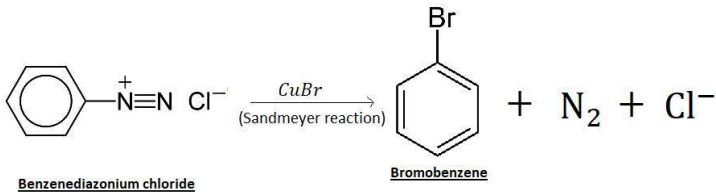
MARK : 20

DURATION : 60min

Q.1	➤ In	1
Q.2	➤ Tertiary	1
Q.3	The number of reacting species taking part in an elementary reaction which must collide simultaneously in order to bring about a chemical reaction is called molecularity of a reaction.	1
Q.4	 Effect of catalyst on activation energy	1

Q.5	$D = \frac{Z \times M}{a^3 \times N_A} \dots\dots\dots(1/2 \text{ mark})$ $a^3 = \frac{2 \times 168.5}{3.99 \times 6.022 \times 10^{23}} \dots\dots\dots (1/2 \text{ mark})$ $a^3 = 14.024 \times 10^{-23} \dots\dots\dots (1/2 \text{ mark})$ $a = (140.24 \times 10^{-24})^{1/3}$ $= 5.19 \times 10^{-8} \text{ cm} \dots\dots\dots(1/2 \text{ mark})$	2
Q.6	 a) b) i) diamagnetism ii) ferrimagnetism	2
OR		
Q.6	 a) Ionic crystal with F-centre b) i) ionic solid and ii) Non- polar molecular solid	2
Q.7	CH₃CH₂Br + KCN -----> CH₃CH₂CN + KBr----- ½ mk A B CH₃CH₂Br + AgCN-----> CH₃CH₂NC + AgBr-----½ mk Compound A – Bromoethane / Ethyl bromide-----1/2mk Compound B — Propanenitrile/ Ethyl cyanide-----½ mk	2

Q.8	1. Tranquilizers/Antidepressant/neurologically active drug 2. Sodium benzoate/salts of sorbic acid/ propanoic acid 3. Saponification.	3
Q.9	For a first order reaction , $k = \frac{2.303}{t} \times \log \frac{[R]_0}{[R]}$ ½ mk $k = 0.0051$, $t = 3 \times 60 \text{ min}$, $[R]_0 = 0.01 \text{ M}$ $0.0051 = \frac{2.303}{3 \times 60} \times \log \frac{0.01}{[R]}$ ½ mk Or $\log \frac{0.01}{[R]} = \frac{0.0051 \times 3 \times 60}{2.303} = 0.3986$ Thus $\frac{0.01}{[R]} = \text{antilog of } 0.3986 = 2.503$ ½ mk Hence $[R] = \frac{0.01}{2.503} = 0.0039 \text{ M}$ ½ mk Calculation of $t_{1/2}$ $t_{1/2} = 0.693 / k$ ½ mk $= 0.693 / 0.0051 = 135.88 \text{ min}$ ½ mk	3
Q.10	i)  ii)  iii) 	4

	 iv) (half mark for reaction & half mark for labelling major product)	
OR		
Q.10	i) $2\text{CH}_3\text{CH}_2\text{I} + 2\text{Na} \longrightarrow \text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_3 + 2\text{NaI}$ ----- 1/2mk Wurtz reaction----- ½ mk  ii) ----- 1/2mk Friedelcraft alkylation reaction. --1/2mk iii) $\text{CH}_3\text{CH}_2\text{Br} + \text{NaI} \longrightarrow \text{CH}_3\text{CH}_2\text{I} + \text{NaBr}$ ----- 1/2mk Finkelstein reaction----- ½ mk Reaction of benzene diazonium chloride react with CuBr  iv) -----½ mk Sandmeyer reaction----- ½ mk	4

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BLUEPRINT OF SECOND INTERNAL TEST MODEL QUESTION PAPER (2022 – 2023)

STD : XII SCIENCE
MARKS : 20

SUBJECT : CHEMISTRY
DURATION : 60 min

	OBJECTIVES					DIFFICULTY LEVEL		
	K	U	S	A		Eas y (E)	Averag e(Av)	Difficul t(D)
Percentage	30 %	40 %	10 %	20 %		30 %	50 %	20 %
Marks	6	8	2	4		6	10	4

Variation of $\pm 5\%$ is permitted in the above Objectives and Difficulty Level

Type of Questions	Marks	Number 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 -I

SA – II = Short answer II

LA = Long answer

BLUEPRINT OF SECOND INTERNAL TEST MODEL QUESTION PAPER (2022-2023)

Q.No	Type	Unit No. and Name	Objectives	Difficulty Level	Duration (min)	Marks
1	MCQ	7. THE p-BLOCK ELEMENTS	K	E	2	1
2	MCQ	2. SOLUTIONS	U	E	2	1
3	VSA	11. ALCOHOLS, PHENOLS AND ETHERS	K	E	2	1
4	VSA	2. SOLUTIONS	S	Av	2	1
5*	SA -I	2. SOLUTIONS	A	D	5	2
		OR				
5*	SA -I	2. SOLUTIONS	A	D	5	2
6	SA -I	13. AMINES	K	Av	4	2
7	SA -I	13. AMINES	A	D	5	2
8	SA -II	14. BIOMOLECULES	K	E	8	3
9	SA -II	11. ALCOHOLS , PHENOLS AND ETHERS	U	Av	8	3
10*	LA	7. THE p-BLOCK ELEMENTS	U	Av	12	4
		OR				
10*	LA	7. THE p-BLOCK ELEMENTS	U	Av	12	4
TOTAL DURATION IN MINUTES AND MARKS					50 min	20 mks

****Internal choice***

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MODEL QUESTION PAPER

**XII SCIENCE
EXAM : 2nd INTERNAL TEST**

**C H E M I S T R Y
(2022-2023)**

**MARKS:20
DURATION : 60 min**

INSTRUCTIONS :

- i) All questions are compulsory. However Q.Nos. 5 & 10 has internal choice.
- ii) Use logarithm tables for calculations wherever required and not calculators.
- iii) Each question should be attempted only once.
- iv) SECTION A consists of four questions of 1 mark each.
- v) SECTION B consists of three questions of 2 marks each.
- vi) SECTION C consists of two questions of 3 marks each.
- vii) SECTION D consists of one question of 4 marks.

SECTION A		
Q.1	The general electronic configuration of p block elements is _____ ➤ ns^2np^1 ➤ ns^2np^{1-6} ➤ $ns^{1-2}np^6$ ➤ ns^1np^{1-6}	1
Q.2	An aqueous solution of Hydrochloric acid _____ . ➤ obey Raoult's law. ➤ shows negative deviation from Raoult's law. ➤ shows positive deviation from Raoult's law. ➤ form minimum boiling azeotrope.	1
Q.3	Write the IUPAC name of the following compound. $CH_3CH=CHCH_2OH$	1
Q.4	Draw a neat labelled graph to show the effect on the boiling point of water when common salt is added to it.	1
SECTION B		
Q.5	Calculate the Osmotic pressure exhibited by 1.25 molal sucrose solution at 25° C. The density of the solution is 1.34 g / ml . (Given : Molar mass of sucrose = 342 g/mol , R = 0.0821 lit bar mol ⁻¹ K ⁻¹)	2
OR		
Q.5	Calculate the mole fraction of water in 20% (w / v) solution of NaOH. The density of the solution is 1.25 g/ml . (Given Molar mass of NaOH and H ₂ O as 40 g/mol and 18 g/mol resp.)	2
Q.6	Complete each of the following equations and name the reaction i) $C_6H_5NH_2 + CHCl_3 + alc.KOH \rightarrow$ ii) $CH_3CONH_2 + Br_2 + NaOH \rightarrow$	2
Q.7	Compound A on treatment with Lithium aluminium hydride followed by hydrolysis gives Compound B, which is a primary amine with two carbon	2

	atoms. Compound B reacts with mixture of sodium nitrite and hydrochloric acid with the evolution of nitrogen gas and gets converted to Compound C with molecular formula C_2H_6O . Write the chemical reactions involved and name the compounds A and C .	
SECTION C		
Q.8	Answer the following: a) Name the product formed when glucose is oxidised with concentrated nitric acid. b) Name the two components of starch. c) What are essential amino acids?	3
Q.9	Write chemical equation for each of the following conversions. a) Propan-2-ol to Acetone. b) Phenol to Picric acid. c) Methyl bromide to Anisole.	3
SECTION D		
Q.10	Answer the following. a) Write the formulae of any two oxoacids of sulphur. b) Draw the structure of Perchloric acid c) Give reason why NH_3 has a higher boiling point than PH_3 d) Complete the equation: $F_2 + H_2O \longrightarrow ?$	4
OR		
Q.10	Answer the following. a) Write the structural difference between white phosphorus and red phosphorus. b) Draw the structures of $XeOF_4$ c) Give reason why Bond angle in NH_4^+ is greater than that in NH_3 d) Complete the chemical equation: $Cu + 2H_2SO_4 (conc.) \longrightarrow ?$	4

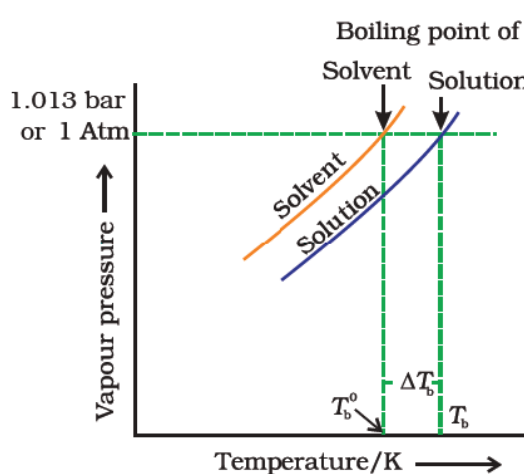
**GOA BOARD OF SECONDARY AND HIGHER SECONDARY EDUCATION
ALTO-PORVORIM, GOA**

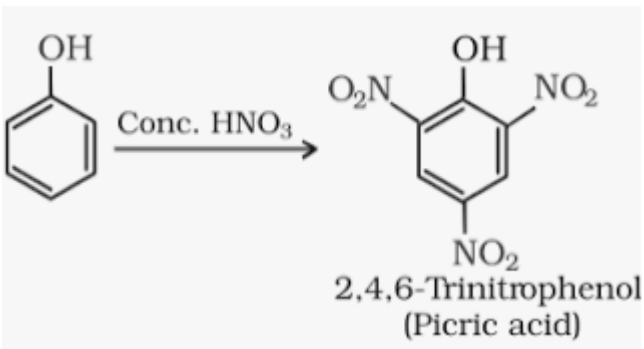
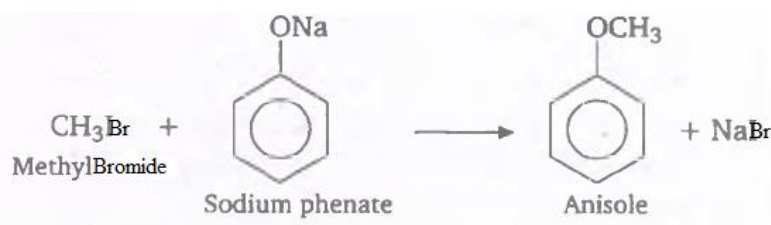
ANSWER KEY TO MODEL QUESTION PAPER OF 2nd INTERNAL TEST (2022-2023)

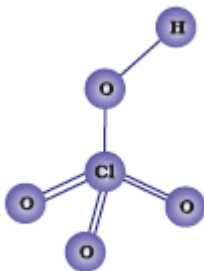
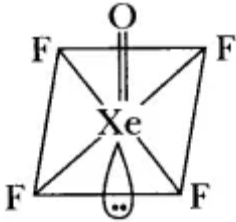
SUBJECT : CHEMISTRY

MARKS : 20

DURATION : 60min

Q.1	➤ ns^2np^{1-6}	1
Q.2	➤ shows negative deviation from Raoult's law.	1
Q.3	But-2-en-1-ol.	1
Q.4		1
Q.5	1.25 molal solution means 1.25 moles of sucrose is dissolved in 1000gm of solvent. Hence , moles of sucrose = $\frac{\text{mass of sucrose}}{\text{Molar mass of sucrose}}$ Or mass of sucrose = moles of sucrose x Molar mass of sucrose $= 1.25 \times 342 = 427.5 \text{ g} \dots\dots\dots \frac{1}{2} \text{ mk}$ Also , Volume of solution = $\frac{\text{mass of solution}}{\text{Density of solution}}$ $= \frac{427.5\text{g} + 1000\text{g}}{1.34 \text{ g/ml}} = 1065 \text{ ml} = 1.065 \text{ L} \dots\dots\dots \frac{1}{2} \text{ mk}$ Thus O.P of solution is , $\Pi V = n R T \dots\dots\dots \frac{1}{2} \text{ mk}$ $\Pi \times 1.065 = 1.25 \times 0.0821 \times 298$ $\Pi = \frac{1.25 \times 0.0821 \times 298}{1.065} = 28.71 \text{ bar} \dots\dots\dots \frac{1}{2} \text{ mk}$	2
OR		
Q.5	20% (w/v)of NaOH means 20 gm of NaOH are dissolved within 100 ml of solution Mass of solution = density of solution x volume of solution $= 1.25 \times 100 = 125 \text{ g} \dots\dots\dots \frac{1}{2} \text{ mk}$ Hence 20 gm of NaOH are dissolved within 125 gm of solution or 20 gm of NaOH + 105 g of water = 125 gm of solution.	2

	Moles of NaOH = $\frac{\text{mass of NaOH}}{\text{Molar mass of NaOH}} = \frac{20}{40} = 0.5 \text{ moles}$ ½ mk Moles of water = $\frac{\text{mass of water}}{\text{Molar mass of water}} = \frac{105}{18} = 5.83 \text{ moles}$ Mole fraction of water = $\frac{\text{moles of water}}{\text{Moles of NaOH} + \text{moles of water}}$ ½ mk Mole fraction of water = $5.83 / 0.5 + 5.83 = 0.921$ ½ mk	
Q.6	i) $\text{C}_6\text{H}_5\text{NH}_2 + \text{CHCl}_3 + \text{alc.KOH} \rightarrow \text{C}_6\text{H}_5\text{NC} + \text{KCl} + \text{H}_2\text{O}$ ----1/2mk Carbylamine reaction -----1/2 mk ii) $\text{CH}_3\text{CONH}_2 + \text{Br}_2 + \text{NaOH} \rightarrow \text{CH}_3\text{NH}_2 + \text{Na}_2\text{CO}_3 + \text{NaBr} + \text{H}_2\text{O}$ --1/2mk Hoffmann bromamide degradation-----1/2 mk (balancing not essential)	2
Q.7	$\text{CH}_3\text{CONH}_2 \xrightarrow[2) \text{H}_2\text{O}]{1) \text{LiAlH}_4} \text{CH}_3\text{CH}_2\text{NH}_2$ ½ mk A $\text{CH}_3\text{CH}_2\text{NH}_2 + \text{HNO}_2 \rightarrow \text{CH}_3\text{CH}_2\text{OH} + \text{N}_2$ 1/2mk C Compound A is Acetamide/ Ethanamide. ½ mk Compound C is Ethanol/ Ethyl alcohol. ½ mk	2
Q.8	a) Saccharic acid. b) Amylose and Amylopectin . c) Amino acids which cannot be produced by our bodies & must be supplied in our diet.	3
Q.9	1. $\text{CH}_3\text{CH}(\text{OH})\text{CH}_3 \xrightarrow{\text{Cu}/573\text{K}} \text{CH}_3\text{COCH}_3$ 2.  3. 	3

Q.10	Answer the following. a) H_2SO_4 and H_2SO_3.  b) Perchloric acid c) NH_3 is associated with inter molecular H-bonding, PH_3 is not. d) $2\text{F}_2 + 2\text{H}_2\text{O} \longrightarrow 4\text{HF} + \text{O}_2$	4
OR		
Q.10	Answer the following. a) White phosphorus is monomeric, whereas red phosphorus is polymeric.  b) Square pyramidal c) NH_3 has lone pair of electron, so, bond angle is 107°, whereas NH_4^+ does not, therefore, bond angle is 109.5°. d) $\text{Cu} + 2\text{H}_2\text{SO}_4(\text{conc.}) \longrightarrow \underline{\text{CuSO}_4} + \underline{\text{SO}_2} + \underline{2\text{H}_2\text{O}}$	4

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

**First term Practical Examination
CHEMISTRY**

Date:
Session:

Duration: **90** Minutes
Max. Marks: **10**

N. B.

- 1) On your answer books write your Examination Seat number and your Laboratory table number.
- 2) Get the burette reading and confirmatory tests initialed by the Examiner.
- 3) Check if the number on (i) your table (ii) answer script and (iii) the containers A, B, and F 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.

SECTION – I

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

Container A: _____ **N/M solution of hydrated Oxalic acid /Mohr's salt.**

Container B: **KMnO₄ Solution**

Using the solution from Container A, 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.

(06 Marks)

Q.2. Q.2. Determine the functional group of the organic compound supplied to you in Container **F** bearing your table number. Give a complete report of all the tests performed. (2 Marks)

Q.3. Q.3. Journal + Viva (1+1 Marks)

Marking Scheme

Scheme for allotment of marks for First term practical examination

1. Volumetric analysis.....6 marks

a.. Correct observations 1 mark

b. Titre reading 3 marks

± 0.2.....3mks

± 0.3.....2 ½ mks

± 0.4.....2 mks

± 0.5.....1 mk

d. Calculations 1 + 1 mark

2. Functional group 2 mark

1.	Carboxylic group	2 marks
2.	Phenolic/ Amino group	If not identified correctly, ½ mark to be given for reporting-COOH group as absent and 1½ marks for detecting phenolic/amino group.
3.	Amino/Phenolic group	If not identified correctly ½ mark to be given for reporting -COOH group as absent, ½ mark for reporting phenolic/amino group absent and 1 mark for detecting the phenolic/amino group correctly.
4.	Carbonyl group	If not identified correctly 1 mark for recording absence of carboxylic group, amino group and phenolic group (½ mark if only two of the groups are reported), ½ mark for detecting CO group and ½ mark for distinguishing Carbonyl group either as -CHO or -CO-
5.	Alcoholic group	If not identified correctly, 1 mark for recording carboxylic, phenolic, amino and carbonyl group as absent. (½ mark only if any of the two above groups are reported) 1 mark for recording alcoholic group correctly.

3. Journal + Viva 1+ 1 mark

SEAT NO:-

TABLE NO:-

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

HSSC Practical Examination -2023

CHEMISTRY

Date:

Duration: 150 mins

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 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 solution of hydrated Oxalic acid /Mohr's salt.**

Container B: **KMnO₄ Solution**

Using the solution from Container A, 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.

(07 Marks)

Q.2. Journal + Viva

(2+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)

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 -2023

1. Student should report in journal:

- Minimum of 4 volumetric exercises.
- Minimum 10 inorganic qualitative analysis.
- Four Physical experiments
 - To prepare lyophilic sol of starch.
 - To determine enthalpy of Neutralization.
 - To study the effect of concentration on the rate of reaction.
 - To study the role of emulsifying agents in stabilizing the emulsion of different oils.
- Minimum Five Organic compounds from the following list covering all five functional groups (Oxalic acid, Acetic acid, Benzoic acid, β -Naphthol, Aniline, Benzaldehyde, Acetone, Ehanol)

2 List of the compounds.

<u>COMPOUND</u>	<u>COMPOUND</u>
<u>NH₄Cl</u>	<u>Zn(NO₃)₂</u>
<u>NH₄Br</u>	<u>ZnCl₂</u>
<u>(NH₄)₃PO₄</u>	<u>CoCl₂</u>
<u>(NH₄)₂CO₃</u>	<u>CoSO₄</u>
<u>Pb(NO₃)₂</u>	<u>Co(NO₃)₂</u>
<u>Pb(CH₃COO)₂</u>	<u>CaCl₂</u>
<u>CuSO₄</u>	<u>Ca(NO₃)₂</u>
<u>CuCl₂</u>	<u>Sr(NO₃)₂</u>
<u>Cu(NO₃)₂</u>	<u>SrCl₂</u>
<u>AlCl₃</u>	<u>BaCl₂</u>
<u>Al₂(SO₄)₃</u>	<u>Ba(NO₃)₂</u>
<u>Al(NO₃)₃</u>	<u>MgSO₄</u>
<u>FeCl₃</u>	<u>MgCl₂</u>
<u>Fe(NO₃)₃</u>	<u>KCl</u>
<u>MnCl₂</u>	<u>KI</u>
<u>MnSO₄</u>	<u>KBr</u>
<u>NiSO₄</u>	<u>K₂SO₄</u>
<u>NiCl₂</u>	<u>K₂CO₃</u>
<u>Ni(NO₃)₂</u>	<u>K₃PO₄</u>
<u>ZnSO₄</u>	<u>K₂C₂O₄</u>

1. Scheme for allotment of marks.

In organic Volumetric Analysis (Redox titration)

(7 marks)

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

(1 mark)

(b) 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 thereading.

(a) Calculations:-

(2 marks)

(1) Calculation of N/M of solution in container B, by using (1) $N_1V_1=N_2V_2$ (2) $N=aM$ formula/e, (a= number of electrons lost or gained per molecule).....

$a_1M_1V_1=a_2M_2V_2$

(1 mark)

(2) Calculate the following.....

(1 mark)

Strength of the solution in container B in terms of _____ g/ _____ mL

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.

2. JOURNAL

(2 Marks)

The marks are to be allotted as follows:

For the experiments performed and recorded during the year. (2 marks)

Viva on Physical expts (Two questions ½ mark each)

(1 mark)

3. Qualitative analysis of Inorganic Compound

(10 marks)

Dry/Preliminary Tests..... (4 marks)

Colour..... (½ mark)

Heating in a dry test tube..... (½ mark)

Flame test (½ mark)

Test for NH_4^+ (½ mark)

Dil HCl 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.

WET TESTS FOR CATION..... (3 marks)

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)
