

Tirupathur District – Quarterly Examination – Sep - 2024
12th Std – Chemistry – Answer Key

Part – I

15 x 1 = 15

Q. No	Answer	Q. No	Answer
1	c) Hydraulic wash	9	a) Excitation of electrons in F center
2	d) Acidified copper sulphate	10	b) PF ₃
3	c) Lead	11	c) 12
4	d) NeF ₂	12	c) 4 – Nitro phenol
5	c) H ₂ SO ₅	13	a) Both Assertion and Reason are true and Reason is the correct explanation of assertion
6	c) 4.89	14	b) Fehling's solution
7	a) Plutonium	15	b) Hydrazine and sodium ethoxide
8	b) NaCl (or) c) ZnO		

Part – II

Answer any 6 questions and question No. 24 is compulsory.

6 x 2 = 12

16	<p>Give the limitations of Ellingham diagram?</p> <ul style="list-style-type: none"> • It is constructed based only on thermodynamic considerations. • It gives information about the thermodynamic feasibility of a reaction. • It does not give any idea about rate of the reaction and the possibility of other reactions. • The interpretation of ΔG is based on the assumption, that the reactants are in equilibrium with the products which is not always true. 	2x1	2
17	<p>What is burnt alum? how it is prepared?</p> <p>Potash alum on heating at 475K, loses water of hydration and swells up. The swollen mass is known as burnt alum. (or)</p> $\text{K}_2\text{SO}_4 \cdot \text{Al}_2(\text{SO}_4)_3 \cdot 24\text{H}_2\text{O} \xrightarrow{475\text{K}} \text{K}_2\text{SO}_4 \cdot \text{Al}_2(\text{SO}_4)_3 + 24\text{H}_2\text{O}$	2	2
18	<p>Give the uses of helium.</p> <ol style="list-style-type: none"> 1. Helium and oxygen mixture is used by divers to prevent the painful dangerous condition called bends. 2. It is used to provide inert atmosphere in electric arc welding of metals. 3. It has lowest boiling point and used in cryogenics. 4. Used for filling air balloons. 	2x1	2
19	<p>Write a short note on chromyl chloride test?</p> <p>Chloride salt + potassium dichromate + con. H₂SO₄ \longrightarrow chromyl chloride (orange red vapours) (or)</p> $\text{K}_2\text{Cr}_2\text{O}_7 + 4\text{NaCl} + 6\text{H}_2\text{SO}_4 \longrightarrow 2\text{KHSO}_4 + 4\text{NaHSO}_4 + 2\text{CrO}_2\text{Cl}_2 \uparrow + 3\text{H}_2\text{O}$ <p style="text-align: center; margin-left: 150px;">Chromyl chloride</p>	1 2	2
20	<p>Explain briefly seven types of unit cell.</p> <ol style="list-style-type: none"> 1. Cubic 2. Rhombohedral 3. Hexagonal 4. Tetragonal 5. Orthorhombic 6. Monoclinic 7. Triclinic 	2	2

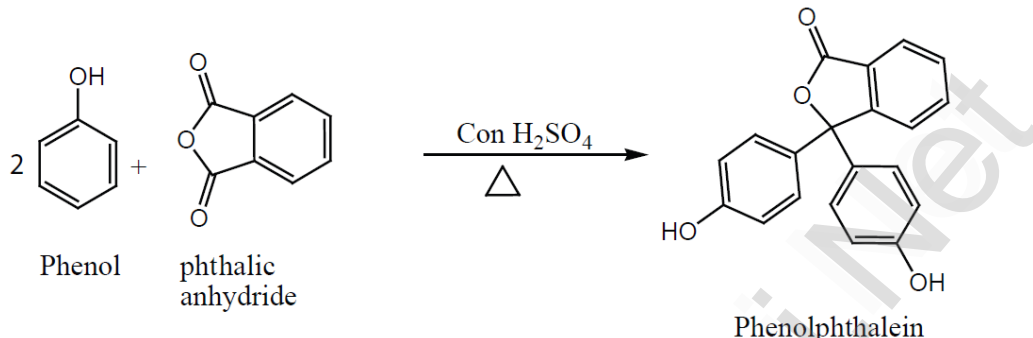
33	<p>An organic compound (A) $C_2H_4O_2$ reacts with thionyl chloride gives compound (B) C_2H_3OCl. Compound (B) reacts with ethanol gives compound (C) with fruit smell. Find (A), (B) and (C). Write the suitable reactions.</p> <p>$C_2H_4O_2 = CH_3COOH$ (A)</p> <p>$CH_3COOH + SOCl_2 \longrightarrow CH_3COCl$ Acetic acid (A) Acetyl chloride (B)</p> <p>$CH_3COCl + C_2H_5OH \longrightarrow CH_3COOC_2H_5$ (B) Ethyl methyl ester (C)</p>	<p>Equation (or) Name (or) Formula</p>	3x1	3
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Part – IV

Answer all the questions.

5 x 5 = 25

34	<p>a) i) Explain zone refining process? (5)</p> <ul style="list-style-type: none"> • Principle: Fractional crystallization • When an impure metal is melted and allowed to solidify, the impurities will prefer to be in the molten region. • Impure metal is taken in the form of rod • Process: one end of the rod is heated using a mobile induction heater. when the heater is moved to the other end, pure metal crystallizes while the impurities will move on to the adjacent molten zone. The process is repeated several times by moving the heater in the same direction again and again to achieve the desired purity level. • Eg: Germanium, Silicon, Gallium 		5	5
	<p>(or) b) Complete the following reactions</p> <p>i) $SiCl_4 + 4 C_2H_5OH \longrightarrow Si(OC_2H_5)_4 + 4 HCl$</p> <p>ii) $Al(OH)_3 + 3HCl \longrightarrow AlCl_3 + 3H_2O$</p> <p>iii) $B_2H_6 + 6 CH_3OH \longrightarrow 2 B(OCH)_3 + 6 H_2$</p>		2	1
	<p>a) i) Prepare bleaching powder? (2)</p> <p>It is prepared by passing chlorine gas through dry slaked lime (calcium hydroxide)(or)</p> <p>$Ca(OH)_2 + Cl_2 \longrightarrow CaOCl_2 + H_2O$</p>		1	2
	<p>ii) Write the molecular formula and structural formula for Phosphoric acid? (3)</p> <p>Phosphoric acid – H_3PO_4 –</p> $\begin{array}{c} O \\ \\ HO - P - OH \\ \\ OH \end{array}$		1½	x 2
35	<p>(or) b) Explain the preparation of potassium dichromate? (5)</p> <p>Ore: Chromite ore</p> <p>Concentration: Gravity separation process.</p> <p>$4 FeCr_2O_4 + 8 Na_2CO_3 + 7 O_2 \xrightarrow{900-1000^\circ C} 8 Na_2CrO_4 + 2 Fe_2O_3 + 8 CO_2$</p> <p>(or) Explanation only</p> <p>(or) Equation without temperature</p> <p>$2 Na_2CrO_4 + H_2SO_4 \longrightarrow Na_2Cr_2O_7 + Na_2SO_4 + H_2O$ (or) Explanation only</p> <p>$Na_2Cr_2O_7 + 2 KCl \longrightarrow K_2Cr_2O_7 + 2 NaCl$ (or) Explanation only</p>		½	½
36	<p>a) i) Write note on schottky defect? (3)</p> <p>1. Arises due to the missing of equal number of cations and anions from the crystal lattice</p>		3	5

	<p>ii) Glycerol \longrightarrow Acrolein</p> $ \begin{array}{ccc} \text{CH}_2 - \text{OH} & & \text{CH}_2 \\ & & \\ \text{CH} - \text{OH} & \xrightarrow[\Delta]{\text{KHSO}_4} & \text{CH} \\ & & \\ \text{CH}_2 - \text{OH} & & \text{CHO} \\ \text{Propane - 1,2,3 - triol} & & \text{Prop - 2- enal (acrolein)} \end{array} $ <p>iii) Phenol \longrightarrow Phenolphthalein</p> <p>Explanation only (or)</p>  <p>Phenol + phthalic anhydride $\xrightarrow[\Delta]{\text{Con H}_2\text{SO}_4}$ Phenolphthalein</p>	1 1 1	
38	<p>a) i) Write any two tests for carboxylic acid? (2)</p> <p>i) In aqueous solution carboxylic acid turn blue litmus red.</p> <p>ii) Carboxylic acids give brisk effervescence with sodium bicarbonate due to the evolution of carbon-di -oxide.</p> <p>iii) When carboxylic acid is warmed with alcohol and Con H₂SO₄ it forms an ester, which is detected by its fruity odour.</p>	2 x 1	
38	<p>ii) Explain Popoff 's rule with an example? (3)</p> <p>It states that during the oxidation of an unsymmetrical ketone, a (C – CO) bond is cleaved in such a way that the keto group stays with the smaller alkyl group.</p> $ \begin{array}{ccc} \text{CH}_3 - \text{CH}_2 - \text{CH}_2 - \underset{\text{O}}{\underset{ }{\text{C}}} - \text{CH}_3 & \xrightarrow[\text{Con HNO}_3]{(\text{O})} & \text{CH}_3\text{CH}_2 - \text{COOH} + \text{CH}_3\text{COOH} \\ \text{pentan - 2 - one} & & \text{Propanoic acid} \quad \text{ethanoic acid} \end{array} $	2 1	
38	<p>(or) b) i) Write Rosenmund reduction (3)</p> $ \begin{array}{ccc} \text{CH}_3 - \overset{\text{O}}{\underset{ }{\text{C}}} - \text{Cl} + \text{H}_2 & \xrightarrow{\text{Pd/ BaSO}_4} & \text{CH}_3 - \overset{\text{O}}{\underset{ }{\text{C}}} - \text{H} + \text{HCl} \\ \text{Acetyl chloride} & & \text{Acetaldehyde} \end{array} $ <p>In this reaction, barium sulphate act as a catalytic poison to palladium catalyst, so that aldehyde cannot be further reduced to alcohol.</p>	2 1	5
38	<p>ii) Write HVZ reaction? (2)</p> $ \begin{array}{ccc} \text{CH}_3 - \text{COOH} & \xrightarrow[\text{H}_2\text{O}]{\text{Cl}_2 / \text{red P}_4} & \text{CH}_2 - \text{COOH} \\ & & \\ & & \text{Cl} \\ \text{Acetic acid} & & \text{Mono Chloro acetic acid} \end{array} $ <p>(or) Explanation only</p>	2 1	