2029 PRE-FINAL EXamination Chemistry Chemical name of infamin (?) As combic acid; protect cells and keeping them healthy, Name a lanthanoid which enhibit (G) 0.5.

and write down the electronic configuration

(m4t) I de Cerium exhibit (+4) state because after loosing 4 electrons it altaen stable noble gas configuration. Ce (58) = [Xe] 4 \$15d'65 2 (Pador) used as a pigment, flat-screen TV's, love every lights bulks and flood lights Dis When does Rapults Law became a Special Case of Lewys Lave?

And Roverels Kern, $p = p^o$. χ When the same Henrys Law, $p = k_H$. χ Henrys Law, $p = k_H$. χ

What is the IUPAC name of 89 AN Crescl

3 - methyl phonol

CH 3 P Leno Salicylaldehyde actich will undergoes SN_2 faster BI Geral is the structure and IUPAC name of the arriene produced by the Hoffmann Bromamied degradation of Benzamé de

cont 2 Benzamide

Benzamide

ANABY +40 IUPAC name of Anilène is Pheneglamine 0,8 Find out haeflife of a first order reaction aeith rate constant $K = 2.31 \times 10^{-14} \text{ s}^{-1}.$ $10^{10} \quad T_{2} = \frac{0.693}{10} = \frac{0.693}{2.31 \times 10^{-14}} = 3 \times 10^{-14} = 3 \times 10^{-14}$ 09 Globular Fibrours O Main structural units of animal tissues O These are act as en 3 ymes, antibodies (1) soluble en mater Dinsolable in anter (II) Insulin and Albuming (II) Kerentin and myosin @ d-helix str. / @ B-pleated str.

S9 OR (I) Essential amine acid Mon-essential amino acid O can't be made by C) Can be made by D'unoven as indispen--sable amino acèd Denouer as dispensable amino acids (11) 9 Essential amé vo (11) 11 of the 20 aceds are lenover amino acids erre non - essential. Depair muscle Lissues (8) Remoral of toning B10 Identify (A), (B) from the following Mand Hill (6H5 MH2)

273 K

PH (4-6)

Benzene Liazonium Chlombe B) (0)-N=N (0)-NH2 (p-aming benzene)

actly is Cret reducing and Mn3+ anidising although both have of 4 Configuration Cr (24) = (A07,83d45 Crest = (As) 18 3 d Gr^{2t} is reducing as its confeiguration changes from J⁴ te J³. (Harf filled try level)

Cr^{2t} — Cr³⁺ + e F^o $M_{r(25)} = (Ar)_{18} 3d^{5}95 = \frac{E_{c_{n}}^{3}+|or^{2t}=-0.4|V|}{F_{E0}}$ $m_{\eta}^{3t} = (A_{\vartheta})_{18} 3d^{4} \qquad [E_{m_{\eta}^{3t}/m_{\eta}^{2t}=1.57v}]$ Clanges from Mn3+ te Mn2+ results half filled (15) configuration which has entra stability. $m_n^{3+} + e^- \rightarrow m_n^{2+} (E^\circ = 1.57V)$ and Mm3+ is onedesing agent.

OSIL and of 2-chloroethanol and ethanol actich is more acidic and achy?

Ins 42C - CH20H 2 - Chara ethanol is more acédec because of presence of (-I) group

0313 How de you emplain the amphaberic behaviour of amino acids?

And Amino acids have amino (-M2) group, basic in nature and accepts a proton and (cost) group loses a proten forming a dipolar ion, Called Zaieller jon. In this form, amino acids behave both as acids and bases. $M_2 - CH - COOH = M_3 - CH - COO (Zwilter)$ im)

A solution of CuSOg is electrolyse with a current of 1.5 A, How much time is required to deposit 0,63 g Cu at cathode? A/C, Faradays 1st Lance of electroleysis $Cl = \frac{EIt}{96500}$ $Cuis \frac{63.5}{2} g$ $FXI = \frac{\omega \times 96500}{63.5} \times 1.5$ $= \frac{63.5}{2} \times 1.5$ 014 OR = 1,276.53 sec. Suggest a way to determine I'm value for formic acid. A. HCOOH = 1° HO + 14COO If we know the motor conductivity value of 1° HCl, 1° HCOONA, 1° Na Cl, are can easily get the value of No HEART.

1 Hee = 2 HO + 1 CO 1º HCOONA = NNAO + 1º HCOO D 1º Nacl = 1º Nat + 100 1 HCOOH = NOHED + NHCOOD $= \bigcirc \bigcirc + \bigcirc \bigcirc - \bigcirc \bigcirc \bigcirc$ 1315 helat product will be formed achen C2H5CHO react with HCHO in presence of dilute NaOH? alrite name of the ryn? And $C_2H_5-C_-H$ + $H-C_-H$ [cross ald all ald all condensation $C_1H_3-C_1H-C_-H$] $C_1H_3-C_1H-C_-H$ $C_1H_3-C_1H-C_1H$ $C_2H_5-C_1H$ $C_2H_5-C_1H$ $C_2H_5-C_1H$ $C_2H_5-C_1H$ $C_3H_5-C_1H$ $C_3H_5-C_1H$ H, 000

B16 achat hoppens when D-Glucase is breated with the following reagents? (i) HI (ii) Bromine water CHO 1+I D CH3-CH2-CH2-CH2-CH3 $(CHOH)_{5}$ n-henane CH2 0H D-Glucose CNH (i) CHO Bn2/H20 (CHOH) 9 [o] $(CHOH)_{4}$ CH2 OH CHOH (Glucanic acid) 1) - Glucose OH write IUPAC name of [CoCl2 (en)2]cl 0,5 = x-2+0-1=0 | Di Chlorobis (etheyle nediamine)

Dx = 3 | Cobalt (111) chloride.

-11

basic difference OH alkat is the betauen danble salt and co-ordination compound? And Souble Salt

Compound

1) Lessociates completely in their individual me Lium

D' den't dissociates ente their individual ions in agricus medium

Detal jour en double salt las normal valency

@ Metalions have kno types of Dency.

(i) primary valency

3) properties of individual salts retain in the dauble salt

(1) Secendary mbrey

(W) For enp, Mehr's salt potash aleem

3) properlies of C.C. is completely désfrent to the in de vidual salt.

(4) K3[Fe(CN)6] (Ni (Co)4)

Much charge in contambs is required for 1 mold Mn0g to Mn1? $4 m_n o_q \theta + Se^- \rightarrow M_n^2 + \text{padderm}_{lasses}$ $\frac{0.5}{47} \qquad (+2)$ (md) of Mnou requeres 5 males of electrons to form Mn2+. 5 m d) de = = 5 f = 5 x 9 6500 = 5 × 96500 = 4,825×10⁵C Faradays Lave states that amount of chemical reaction occurs at any electrode under electrical energy is proportional to the electricity passed shrough He electro teste -Alc, Formdays 1st Law, W= EIR 96500 All, Foradays 2 rd Law, all = 2 = No. dignt.

819 19.5 g & CH2 F COOH is dissolved. in 500 g of water. The depression in Freezing Paint of water observed is 1°C. Calculate (i) factor & Ka for Fluonacetic acéd. (Kg = 1.86 Do Mo) Observed Colligative Property and theoritical Colligative Property (ST8) 865 (ST8) theo (Kg x molalety) theo (1-86 X (19.5/48) 1.86 X0,50 = 0.93 0 0 1.0753

CH, FCOUTH -> CH3 FCOD $C \propto$ to fime C(1-x) 12 C(1-x) + Cd + Cd = C(1+x) i = 1+ X 3 d = 1-1=1.0753 -1 0.0753 [CH3FCOD] [H+] Ka = / CH2 F (ODH) Cd. (d) = Cd / 1-d 2 0.50 X (0.0753) 1-0.0753 = 3.07 ×10-3

819 OR The V.P. of pure liquid A and B) are 400 mm Hg and 600

mm Hg respectively at 300k. If modar satio
of two liquids A and B) are 3:2. what is botal V.P. of
solution.

Total vapour pressure (PT) = $\chi_A \times P_A + \chi_B \times P_B^c$ $=(0,60 \times 400) + (0.40 \times 600)$ XA=0,60 = 240 + 240 NB =0.40 = 480 mm & Hg as the molar ratio u3:2 9864089106 De ally anines less basic than alkyl amines. lane pair of electrons of N as lis engaged with Resonance arithmeter and the molecule. Aliphatic amines can easily danate elections te others as resonance is not involved.

... alighatic amines is more basic than avomalic amines (b) C2H5OH > C2H5 MH2 > (CH3)2 MH 78.37°C 16.6°C 82

Explain, transition metals are god Catalyst.

Ans. Transition metals have partially filled d- orbitals and also have a tendency to show large no, of anidation states and the ability to form complenes which makes them a good catalyst lg, Fe used in Haker process to produce ammeria.

The enthalpies of atomization of the

transition metals are high

Ans, Transition metals have ligh eshective nuclear charge, greater number of valence electrons and same unpaired electrons. They thus have Strong metal - metal bonderg. Hence they have high enthalpy of atomization.

Cet ion is not stable in aqueons Solution Ans: Cut (og) is renstable en solution and undergoes simultaneous ouédation and reduction. 2 cu tog) = cu2+ eg, + cucg High energy is required to remove one electron from Cet be Ce2+ high by dration energy of Ce2+ compensates Dw the literation of Fe SO 4 are the berit UMnoq en acédic medium, délute HCl is not resed. And Del. HS Og is an oride sing agent and orielises Fe Sog to Fe (Soy)3 Stil HCl is a reducing agent and léberates chlorine on reacting au la Umn 0g Solution. Hence, the part cef the onygen produced from 4 Mn0g is used by HCC.

Bolanced equation,

2 KMmou (ag) + 10 Fe so 4 (ag) + 8 1/2 so 4 (ag) -> 5 Fe, (soy)

allat are azeotropes? allat is meant by negative deviation from Racull's Law and Low is the sign Smix H related to negative Leviation from Raouels Kaue? Azeohopes is a binary menture of two on more liquids that boils and distil at a constant temperature at a given pressure all thank changing ets L'encentration or composition. I when the actual vopour pressure of a non-ideal solution is lower than expected vapour pressure show regulive de notion. 29. minture of Morform and acetone show negative denation. P°, P°, Dmix H = - ve sign X4=1 XB=1 XB=0 XA=0

O23 Explain the geometry and magnetic property of [Fe (CN)6] using VBT com 0,5. & Fe is x -6=-4 > x=2 Fe (26) = [AD] 18 3d 6 95 Fe 2+ = [Ar]₁₈ 3d⁶
3d 45 4P Fe^{2†} = [747/7/1/1] (CN) is a strong field ligand so, pairing takes place. 6 pair of electrons from (CN) will be denated to form by bri desortion 10 × 5 p3/ Thoufare Hybridisation = 4 Sp 3 Geometry = octobe drail Magnetic proporty = Diamagnetic (zero 0323 OR De Hour many geometrical isomers 3-are possible for compound [cr (29)] Ch ((204)3)3- shows optical isomerism. Both d- John and l-form as analabo is a bidentale Therefore zero(o) G.I. present. 0323 O d-outsifal splitting for actahedral Crystal field. D23

Collaboration will be the correct order for

the wavelengths of absorption en

the visible region for the pllowing

[Ni(en)3]2+ [Ni(NH3)2]2+ [Ni(H20)6]2+

Ans: spectrochemical series order 60 (NH3 (en Thus CFSE will be en the to llowing order, 10 H20 (1° m/3 (1° en Hence varelengts of absorption en the visible region will be (Ni(H20)6)2+ > [Ni(M+3)6)2+ \(Ni(en)) 924 How does the acédified permangante Solm react acité the zollowing ? Write the ionic equations for the reaction. des @ KI & Fe2+ O 42 C20g a 2 U Mnog + pUI t8H2 SO4 -2 Mn SO4 \$I to 4 SO 2 Mnog + 10I + 16H& -2 Mn 2+ +5I2 + + HO

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(5) $2 \text{ MnOy} + 10 \text{ Fe}^{2t} + 16 \text{ H} \rightarrow 2 \text{ Mm}^{2t}$ $+ 10 \text{ Fe}^{3t} + 8 \text{ Hz} O$

(c) $2m_{n}o_{q} + 5C_{2}o_{q}^{2} + 16H^{\oplus} \rightarrow 2m_{n}^{2} + 8760$ + $10Co_{2}$

\$ 24 <u>CR</u> allat are interestitial compounds? Name the metals used for formation & bronze. Name the cotalesst used in centact process of Ha son synthesis.

Ans. Interstital compounds are formed when H, C, N atoms become trapped inside the crystal lattice of metals.

-> Bronze is a alloy of copper & Lin. - vanadicem Pentoxide, V205

Answer the following questions @ wehat is the order of the reaction? 109 Ro 6 unit of rate constant C) calculate rate constant? And For 1st order reaction $K = \frac{2.303}{t} \log \frac{Ro}{Rt}$ \$\frac{kt}{2.303} = 109 \frac{Ro}{kt} Low @ 1st order reaction B) unit of rate constant (k) = (con) 1-n t -1 = (mo/L-1)'-1 t-1 C) HB, K = 0.4343= 1 - min - 1 > K = 1,0001929 min

O26 Convert the following Bromobenzene to benzoic acid

Bromobenzene to benzoic acid

MyBr

Of DCO2

(ii) HO/160

Bunzoic acid

+ Mg(OH) & + Mg(OH) Bz (b) Methanal to 2- Methylpropan -1-ol the HCHO+CH3-CH-MgB2-CH3-CH-CH20MgB2 methanal Isopopyl mogresium bruide (H3)

Propere le acetone (H3) CH3 - CH - CH2 071 $CH_3 - CH = CH_2$ HE L HO CH3-CH-CH3 2 - Metheyl grapan -1-87 HA 12 Cr207 CH3-C-CH3

0 26. OR

(i) Propanal and propanone can be distinguished by the following tests.

(a) Tollen's test

Propanal is an aldehyde. Thus, it reduces Tollen's reagent. But, propanone being a ketone does not reduce Tollen's reagent.

$$CH_{3}CH_{2}CHO + 2 \left[Ag \left(NH_{3} \right)_{2} \right]^{+} + 3OH^{-} \longrightarrow CH_{3}CH_{2}COO^{-} + Ag + 4NH_{3} + 2H_{2}O$$
Propanal Tollen's reagent Propanoate ion Silver mirror

(b) Iodoform test:

OR

Aldehydes and ketones having at least one methyl group linked to the carbonyl carbon atom respond to iodoform test. They are oxidized by sodium hypoiodite (NaOI) to give iodoforms. Propanone being a methyl ketone responds to this test, but propanal does not.

(ii) Ethanol and ethanoic acid

The chemical test to distinguish between Ethanoic acid and Ethanol: Sodium bicarbonate test (NaHCO $_3$):

In the **Sodium bicarbonate test**, Sodium bicarbonate is added to the sample of organic acid. After some time Sodium bicarbonate reacts with the acid sample to evolve Carbon dioxide (CO_2) gas.

Ethanoic acid reacts with Sodium bicarbonate to form Carbon dioxide with effervescence.

$$\begin{array}{ccc} CH_3\,COOH(aq) + NaHCO_3\,(s) \rightarrow CH_3\,COONa(aq) + CO_2(g) + H_2O(l) \\ \text{(Ethanoic} & \text{(Sodium acetate) (Carbon (Water)} \\ \text{acid)} & \text{bicarbonate)} & \text{dioxide)} \end{array}$$

But, Ethanol does not give any reaction with Sodium bicarbonate.

(iii) Aniline and benzylamine can be distinguished by their reactions with the help of nitrous acid, which is prepared in situ from a mineral acid and sodium nitrite. Benzylamine reacts with nitrous acid to form unstable diazonium salt, which in turn gives alcohol with the evolution of nitrogen gas.

$$\begin{array}{c} C_6H_5CH_2-NH_2+HNO_2 & \xrightarrow{NaNO_2+HCl} \left[C_6H_5CH_2-N_2^+C\overline{l}\right]\\ \text{Benzylamine} & (Unstable) \\ & & H_2O \\ & & \\ & & N_2\dagger + C_6H_5CH_2-OH + HCl\\ & & \\$$

On the other hand, aniline reacts with HNO_2 at a low temperature to form stable diazonium salt. Thus, nitrogen gas is not evolved.

$$C_6H_5NH_2 \xrightarrow{NaNO_2+HC1} C_6H_5 - N_2C_1 + NaC_1 + 2H_2O_27$$
(a)

27 (b). Example of pseudo first order reaction is as follow: -Sucrose on reacting with excess water produces glucose and fructose

Q. 27 OR ans.

$$2H_zO_z \rightarrow 2H_zO + O_z$$

In 50 minutes, the concentration is reduced to one fourth

$$(\because \frac{0.5}{0.125} = 4)$$

Hence 2 half life periods correxponds to 50 minutes.

$$t_{1/2} = 25 \, \text{min}$$

The rate constant
$$k=\frac{o.693}{t_{1/2}}=\frac{o.693}{25}$$

Rate of decomposition of

$$H_2O_2 = k[H_2O_2] = \frac{0.693}{25} \times 0.05 = 1.39 \times 10^{-3} \text{ mol/min}$$

Rate of formation of oxygen is one half the rate of decomposition of $\mathrm{H_{2}O_{2}}$.

It is
$$\frac{1}{2} \times 1.39 \times 10^{-3} = 6.93 \times 10^{-4} \text{ mol/min}$$

28 (b) A primary cell is a kind of electrochemical battery which cannot be recharged and the chemicals are to be replaced in it regularly. E.g.- Dry cell

Q. 29.

X is an alkene
Y is an aldehyde with $-CH_3$ group
Z is a methyl ketone $CH_3CHO + [Ag(NH_3)_2]^+ + OH^- \longrightarrow CH_3COO^- + Ag + NH_3 + H_2O$ $CH_3COCH_3 + NaOH + I_2 \longrightarrow CHI_3 + CH_3COONa$ X: $CH(CH_3) = C(CH_3)_2$ Y: CH_3CHO Z: $O = C(CH_3)_2$ (1.5 = 1/2 each) $CH_3COCH_3 + CH_3CHO$ $Ag + CH_3COONa$ $CH_3COCH_3 + CH_3CHO$ $Ag + CH_3COONa$ $CH_3 + CH_3COONa$ $CH_3COCH_3 + CH_3CHO$ $Ag + CH_3COONa$ $CH_3 + CH_3COONa$ $CH_3COCH_3 + CH_3CHO$ $CH_3COCH_3 + CH_3CHO$ $CH_3COCH_3 + CH_3CHO$ $CH_3COCH_3 + CH_3CHOOH$ $CH_3CHOONA$ $CH_3COO^- + Ag + NH_3 + H_2O$ CH_3COONA CH_3COONA

30(a) The dipole moment of chlorobenzene is lower than that of cyclohexyl chloride

Ans.: The dipole moment of chloro-benzene is less than cyclo hexyl chloride as in chloro benzene C-CI bond is sp2 hybridised where as in cyclohexyl chloride the C - C I bond is Sp3 Hybridised . As sp2 has more s character and more electronegative than sp3.

b) Alkyl halides though polar are immiscible with water.

Ans.: The new force of attraction between the alkyl halides and water molecules is weaker than the alkyl halide-alkyl halide and water-water forces of attraction. Hence, alkyl halides (though polar) are immiscible with water.

c) Grignard reagent should be prepared under anhydrous conditic

Ans.: Grignard reagents (R - Mg - X) are readily decomposed by water to produce alkanes. That is why they should be prepared under anhydrous conditions.

(d) SOCI2, is preferred for the preparation of haloalkanes from alcohol?

Ans.: The thionyl chloride method is preferred over hydrogen chloride or phosphorous chloride method for the preparation of haloalkanes because both the by-products (SO₂ and HCI) in this case are gases and escape leaving behind pure chloroalkane.

(e) Aryl halides are extremely less reactive towards nucleophilic substitution reaction?

Ans.: Aryl halides are less reactive towards nucleophilic substitution reaction as compared to alkyl halides is because of resonance stabilization in aryl halide. Due to resonance, C-X bond becomes shorter and stronger and cannot be easily replaced by nucleophiles.

(f) A racemic mixture is optically inactive, why?

Ans: A racemic mixture is optically inactive due to the external compensation of equal percentage of (+) and (-) forms. The cis form exists in three - diastereomers.

For Question No. 29/OR/ answer Please contact 9864089106