



माध्यमिक शिक्षा मण्डल, मध्यप्रदेश, भोपाल

2023
32 पृष्ठीय

परीक्षार्थी द्वारा भरा जावे ↓

परीक्षा का विषय	विषय कोड	परीक्षा का माध्यम
Chemistry	2 2 0	English

स्टीकर तीर के निशान ↓ से मिलाकर लगाये

संस्कृतिक शिक्षा मण्डल, म.प्र., भोपाल

सरल क्रमांक **B-23**

परीक्षार्थी का रोल नम्बर **0511316**

अंकों में

2	3	3	1	3	9	2	0	5	✓
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शब्दों में

Two	Three	Three	One	Three	Nine	Two	Zero	Five	✓
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नीचे दिये गये चढाहण अनुसार रोल नम्बर भरें।

परीक्षार्थी

प्रश्न पत्र का सेट **C**

परीक्षार्थी का कक्ष क्रमांक **hall**

परीक्षा का दिनांक **18 03 2023**

परीक्षा का नाम एवं परीक्षा केन्द्र क्रमांक की मुद्रा

जयर सेकेण्डरी परीक्षा **SCM-Code**
311219

परीक्षक का नाम एवं हस्ताक्षर **Dr. Babha Jankar**

केन्द्राध्यक्ष/सहायक केन्द्राध्यक्ष के हस्ताक्षर **S. ...**

परीक्षक एवं उपमुख्य परीक्षक द्वारा भरा जावे ↓

निर्धारित किया जाता है कि हेलो क्राफ्ट स्टीकर क्षतिग्रस्त नहीं पाया गया तथा अन्दर के प्रश्नों के अनुरूप मुख्य पृष्ठ पर अंकों की प्रविष्टि एवं अंकों का योग सही है।

निर्धारित मुद्रा : नाम, पदनाम, मोबाईल नम्बर, परीक्षक क्रमांक एवं पदांकित परीक्षार्थी के नाम की मुद्रा लगाएँ।

उपमुख्य परीक्षक के हस्ताक्षर एवं निर्धारित मुद्रा परीक्षक के हस्ताक्षर एवं निर्धारित मुद्रा

W.R. KHAPRE
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G.S. M. ...
V.N-17948

केवल परीक्षक द्वारा भरा जावे।
प्रश्न क्रमांक के सम्मुख प्राप्तांकों की प्रविष्टि करें।

प्रश्न क्रमांक	पृष्ठ क्रमांक	प्राप्तांक (अंकों में)
1		
2		
3		
4		
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कुल प्राप्तांक		

परीक्षार्थी द्वारा भरा जावे ↓

परीक्षक/सहायक केन्द्राध्यक्ष एवं परीक्षक द्वारा भरा जावे ↓

परीक्षक एवं उपमुख्य परीक्षक द्वारा भरा जावे ↓

2

5

पृष्ठ 2 के अंक

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प्रश्नक

Ans of Q.1

$RONa$

CF_3COOH

$$\Delta = \frac{nRT}{V}$$

2

Ce

+4

Finkelstein reaction

Ans of Q.2

ethylenediamine tetraacetate

-nitro anisate and p-nitro
more

riboflavin

55.6

Zero

green

Ans of Q.3

Hmann Bromide - primary amine

Milk sugar - lactose

Sucrose - $+12 H_2O$

glucose

+7

Primary valence

Negative ions



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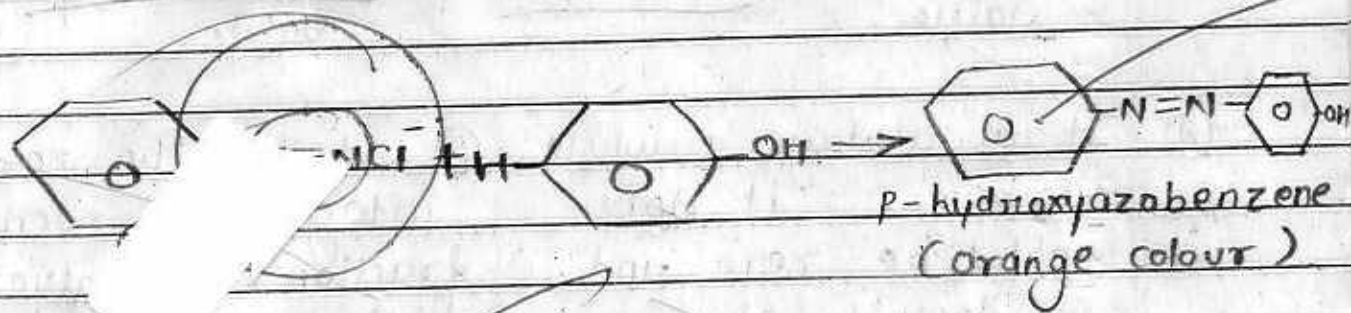
(iii) R-O-R Ether

Ans of Q.4

(i) p-Dichlorodiphenyltrichloroethane

(ii) As benzene diazonium salts like benzene diazonium chloride reacts with phenol to form p-hydroxyazobenzene or reacts with aniline to form p-aminoazobenzene and hydrochloric acid i.e.,

B
S
E



(ii) $C_6H_5SO_2Cl$ (Benzene sulphonyl chloride)

(iii) α -amino acids.

(v) The formula of molar conductivity is $\frac{K \times 1000}{C}$

here $K =$ conductivity (in $S\ cm^{-1}$)
 $C =$ concentration in moles per litre

(vi) $mol\ L^{-1}\ s^{-1}$
(Ans) $3d^1\ 4s^2$

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Ans of Q.5

Molecularity

Order

It is the number of reacting species which must collide simultaneously in order to bring about a chemical reaction. It is a theoretical value.

It is the sum of the powers to which the concentration terms are raised in the rate law expression. It is an experimentally determined value.

It is always a whole number. It ~~does~~ can't be zero and it doesn't give any information about the mechanism of reaction.

It can be zero, integer or even in fraction. It gives us the information about the mechanism of reaction.

Ans of Q.6

Hexaminecobalt (III) chloride
~~Potassium tetracyanonicklate (II)~~

Potassium tetracyanonicklate (II)

B
S
F

5



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Ans of Q.7.

Co-ordination number - Co-ordination number of the central metal atom or ion in a coordination complex is defined as the number of the ligating donor atoms to which the metal is directly attached.

For ex - in $K_2 [Ni(CN)_4]$ the coordination number of nickel is 4.

Other example is $[Co(NH_3)_6]Cl_3$ in which co-ordination number of cobalt is 6.

Ans of Q.8.

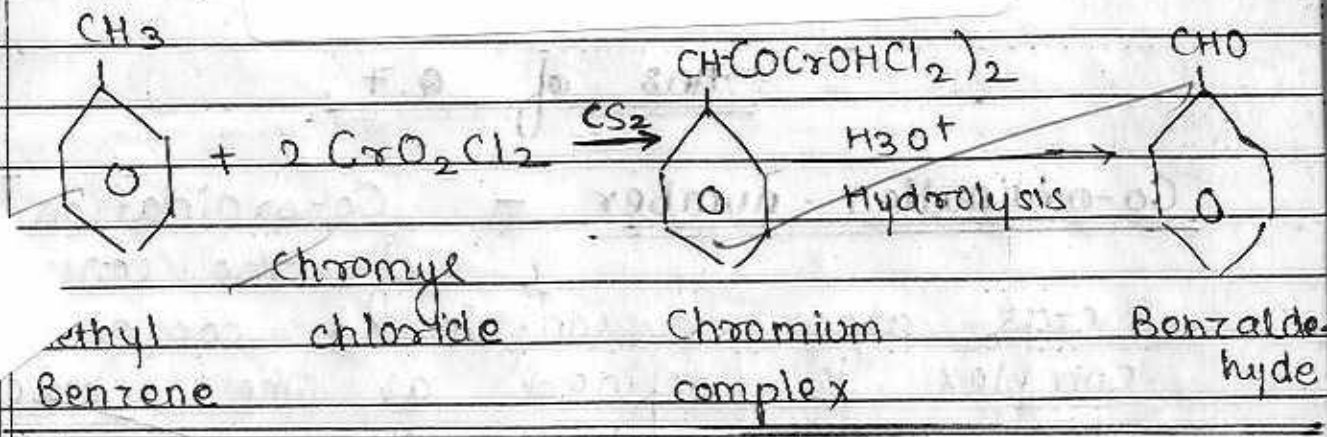
Ehrlich reaction - In this reaction, methyl benzene known as toluene reacts with chromyl chloride to reduce oxidise the methyl group into a chromium complex and then the hydrolysis of the compound yields benzaldehyde.

Chemical equation is as follows :-

6



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Ans of a9 OR

B
S
E

The K_b value of ethyl amine is ~~4.5×10^{-4}~~ ^{more} than that of ammonia is ~~1.8×10^{-5}~~ larger is the K_b value, larger is the basicity strength. In the ethyl amine, due to the presence of ~~+~~ Inductive effect of ethyl group the availability of lone pair of electrons on nitrogen atom of amine increases due to which N atom can easily accept the proton. Hence ~~due to~~ the ethylamine is more basic than ammonia since ammonia has no alkyl group due to which availability of electron on nitrogen atom of ammonia is less as compared to ethylamines. The basicity solely depends upon the availability of lone pair of electrons.

7



Ans of Q.10 OR

DNA

RNA

① In DNA, deoxyribose sugar is present. It helps in the transmission of characters from one generation to other.

② In RNA, ribose sugar is present. It helps in the synthesis of protein.

B
S
E ② It is present inside the nucleus ^{of cell} and contains thymine base but doesn't contain uracil and comparatively less reactive.

② It is present in the cytoplasm of cell and contains uracil but not thymine. It is comparatively more reactive than DNA.

Ans of Q.11

Mol. Fraction :- Mole fraction of any component of the solution is defined as the ratio of the number of moles of the component to the total number of moles of all the components of the solution. It is denoted by x .

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प्रश्न 11

For example -

In a binary mixture

there are two components A and B

and no. of moles of A = n_A

no. of moles of B = n_B

mole fraction of A $x_A = \frac{n_A}{n_A + n_B}$

similarly

mole fraction of B $x_B = \frac{n_B}{n_A + n_B}$

Ans of Q.12 GR

Faraday first law of Electrolysis :-

According to the Faraday first law of electrolysis, the amount of chemical reaction which occurs at any electrode during electrolysis is directly proportional to the quantity of electricity passed through the electrode.

If w gram of salt is deposited by passing charge Q when current I is flowing for time t



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According to Faraday's law, (iii)

$$W \propto Q$$

$$\Rightarrow W = ZQ$$

where Z is a proportionality constant known as electrochemical equivalent of the substance

$$W = ZIt$$

$$Q = It$$

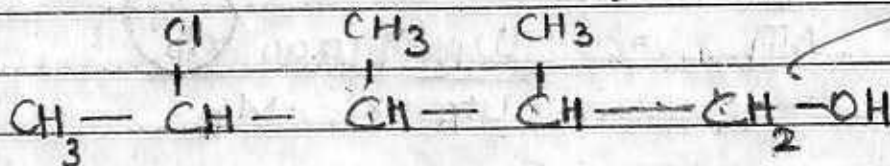
I = 1 Ampere and t = 1 sec

Then

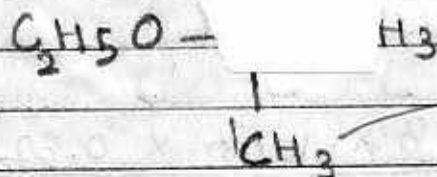
The electrochemical equivalent of substance may be defined as the mass of substance deposited at the electrode when one Coulomb of charge flows through it

Ans of Q.13 OR

ii



4-chloro 2,3 dimethyl pentan-1-ol



2-ethoxy propane

10

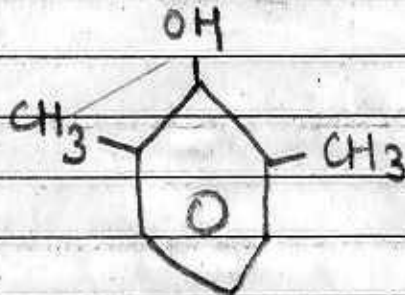


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iii)



2,6 dimethyl phenol

Ans of a. 14 OR

Given,

Mass of glucose $W_B = 18 \text{ gm}$
 Molar mass of glucose $M_B = 180 \text{ gm}$

Mass of water $W_A = 1000 \text{ gm}$
 Molar mass of water $M_A = 18 \text{ gm}$

K_b for water = 0.52 K kg/ml

Now, we know that

$$\Delta T_b = \frac{W_B \times 1000}{W_A \times M_B}$$

where ΔT_b is Elevation in Boiling point

So

$$\Delta T_b = \frac{18 \times 1000 \times 0.52}{1000 \times 180} = \dots$$

11

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Boiling point of pure water $T_b = 373.15 \text{ K}$

new boiling point will be $T_b + \Delta T_b$

$$= 373.15 + 0.052$$

$$= 373.202 \text{ K}$$

So, water will boil at 373.202 K temperature

Ans of Q.15

Unit of Rate constant for first order reaction

First order reaction is that reaction in which the rate of reaction is directly proportional to the first power of the concentration of reactants

$$-\frac{dR}{dt} \propto [R]^1 \Rightarrow -\frac{dR}{dt} = k [R]^1$$

$$\text{So unit of rate constant } k = \frac{\text{unit of } \left(-\frac{dR}{dt}\right)}{\text{unit of } [R]}$$

$$= \frac{\text{moles L}^{-1} \text{ s}^{-1}}{\text{moles L}^{-1}}$$

$$= \text{s}^{-1}$$

So the unit of rate constant of first order reaction is s^{-1}



unit of rate constant is second^{-1}

Similarly

Unit of rate constant for second order reaction will be $\text{moles}^{-1} \text{litre s}^{-1}$

Ans of Q.16

<u>B</u> <u>d-block elements</u>	<u>f-block elements</u>
<p>(1) The elements in which the last electron enters the penultimate $(n-1)d$ orbitals are known as d-block element</p>	<p>(1) The elements in which the last electron enters the antepenultimate $(n-2)f$ orbital are known as f-block elements</p>
<p>(2) These are known as transition elements and are found in abundance in nature</p>	<p>(2) These are known as inner transition elements and rare earth metals because they are found in less quantities in nature</p>
<p>(3) $(n-1)d$ and ns two subshells are incomplete in d-block elements.</p>	<p>(3) $(n-2)f$, $(n-1)d$ and ns three subshells are incomplete in f-block elements.</p>

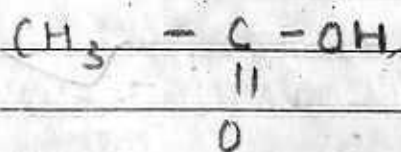
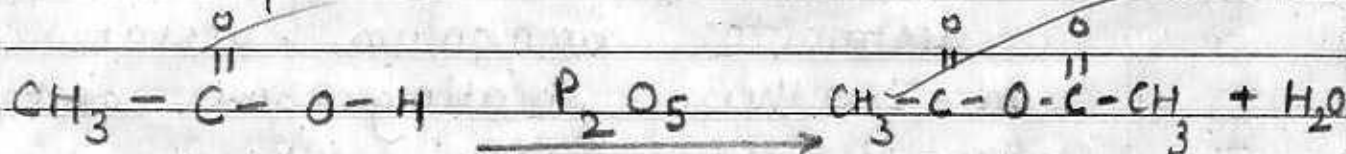


its general electronic configuration is
 $(n-1)d^{1-10} ns^{1-2}$

Their general electronic configuration is
 $(n-2)f^{1-14} (n-1)d^{0-1} ns^2$

Ans of Q.19.

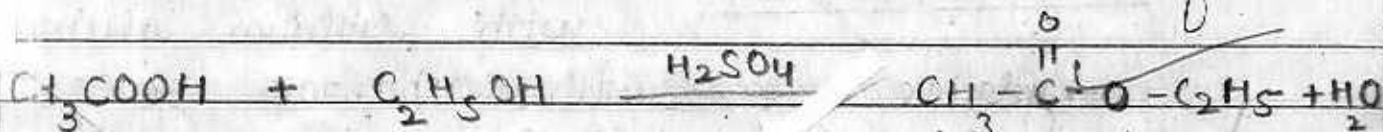
- i) Acetic acid reacts with mineral acids like sulphuric acid or hydrochloric acid or with P_2O_5 to form acetic anhydride



(Acetic acid)

(Acetic Anhydride) Water

- ii) Ethyl acetate - Acetic acid reacts with ethanol in the presence of H_2SO_4 to form ethyl acetate. This reaction is known as esterification.



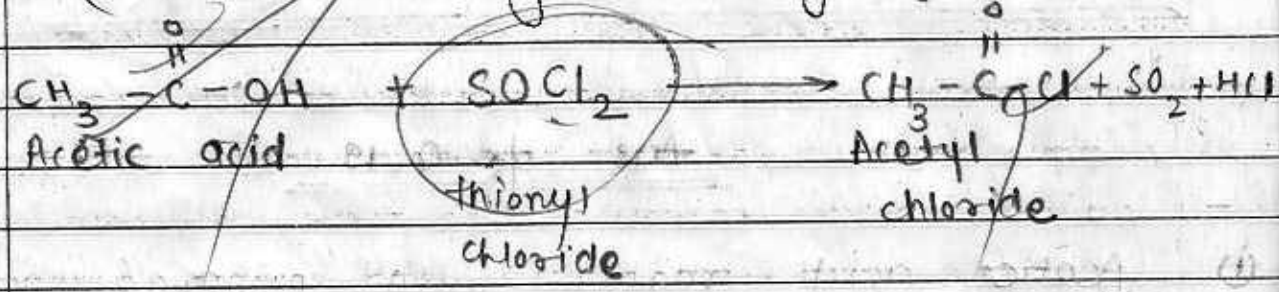
Acetic acid

Ethanol

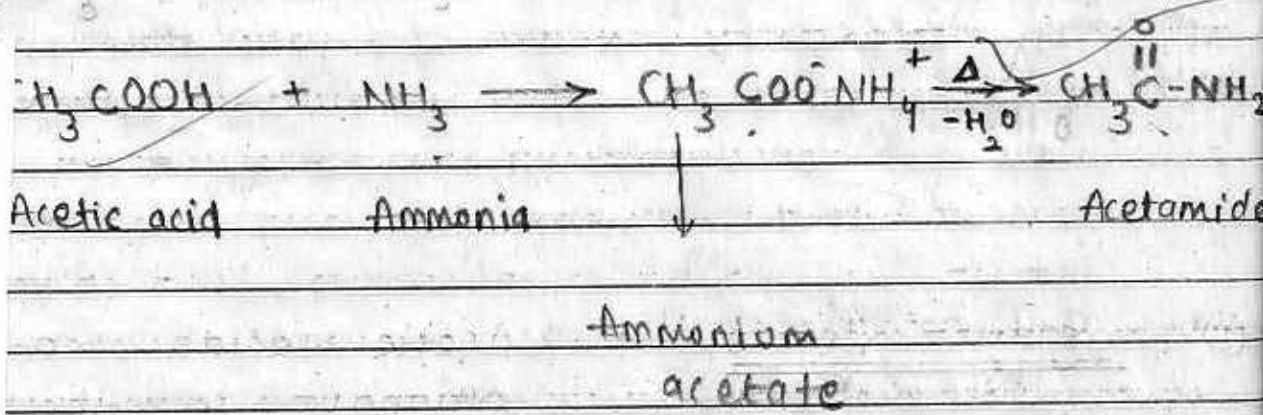
Ethyl acetate



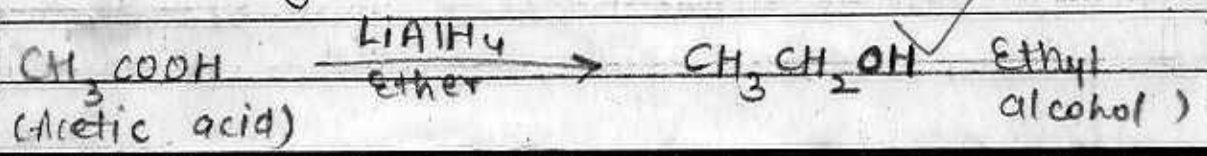
Acetyl chloride - Acetic acid reacts with thionyl chloride (SOCl_2) to give acetyl chloride



Acetamide - Acetic acid reacts with ammonia to form an acetamide ammonium acetate which on further heating gives acetamide.



Ethyl alcohol :- Acetic acid on reduction with lithium aluminium hydride or with diborane gives ethyl alcohol



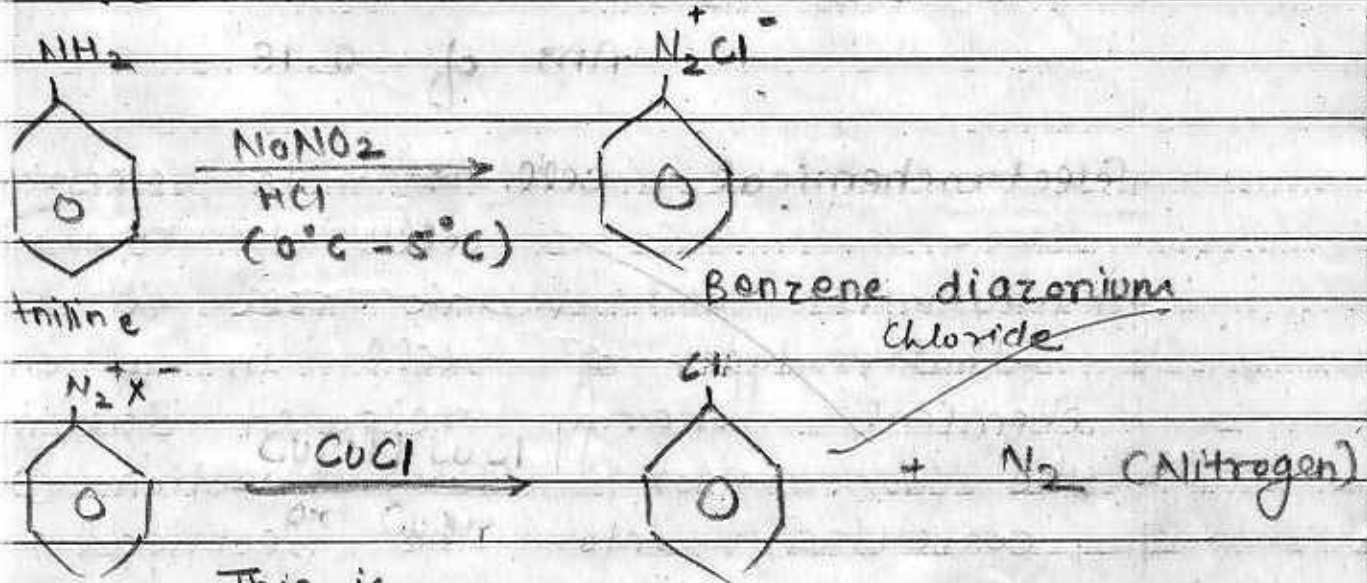


Ans of Q.17 OR

1) Sandmeyer reaction :- When a primary aromatic amine like aniline reacts with sodium nitrite and hydrochloric acid at low temperature to (273 - 278) benzene diazonium salt chloride is formed. This is known as diazotisation.

B
S
E

When benzene diazonium salt chloride reacts with cuprous halide (CuCl) or like CuCN, CuCl or CuBr then the diazogroup is replaced by CN (cyano), chloro or Bromo resulting in the formation of cyano benzene or aryl halide. This reaction is known as Sandmeyer's reaction.



This is Sandmeyer's reaction

Benzene diazonium salt

Chlorobenzene

16

योग पृष्ठ

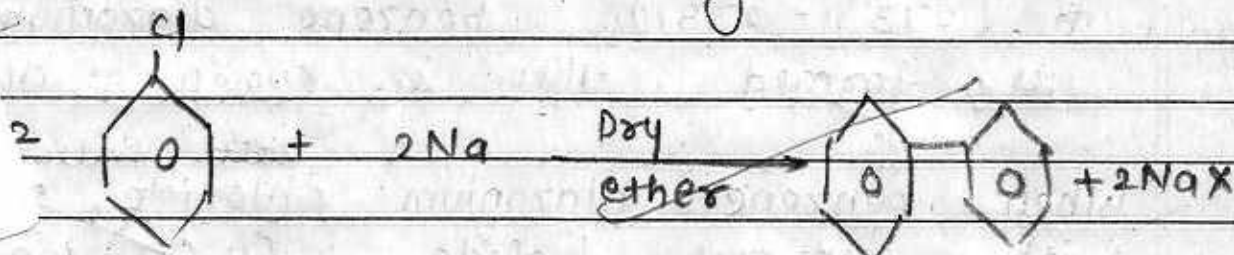
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कुल अंक



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(iii) Fittig reaction - Two molecules of ~~aryl~~ ~~fit~~ aryl halides react with sodium metal in the presence of dry ether to form diphenyl and sodium halide. This reaction is known as Fittig reaction.

B
S
E

chlorobenzene

Biphenyl

Similarly, when iodobenzene is passed over hot copper at 200°C , diphenyl is formed.

Ans of Q.18.

Electrochemical cell :- An electrochemical cell also known as galvanic and voltaic cell is that type of cell in which chemical energy released during the redox reaction is converted into the electrical energy.

(17)



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In this cell, there are two half cells one is oxidation half cell known as anode and the another one is reduction half cell known as cathode.

Daniel cell is an example of electro-chemical cell.

Its structure and chemical reactions are as follows:-

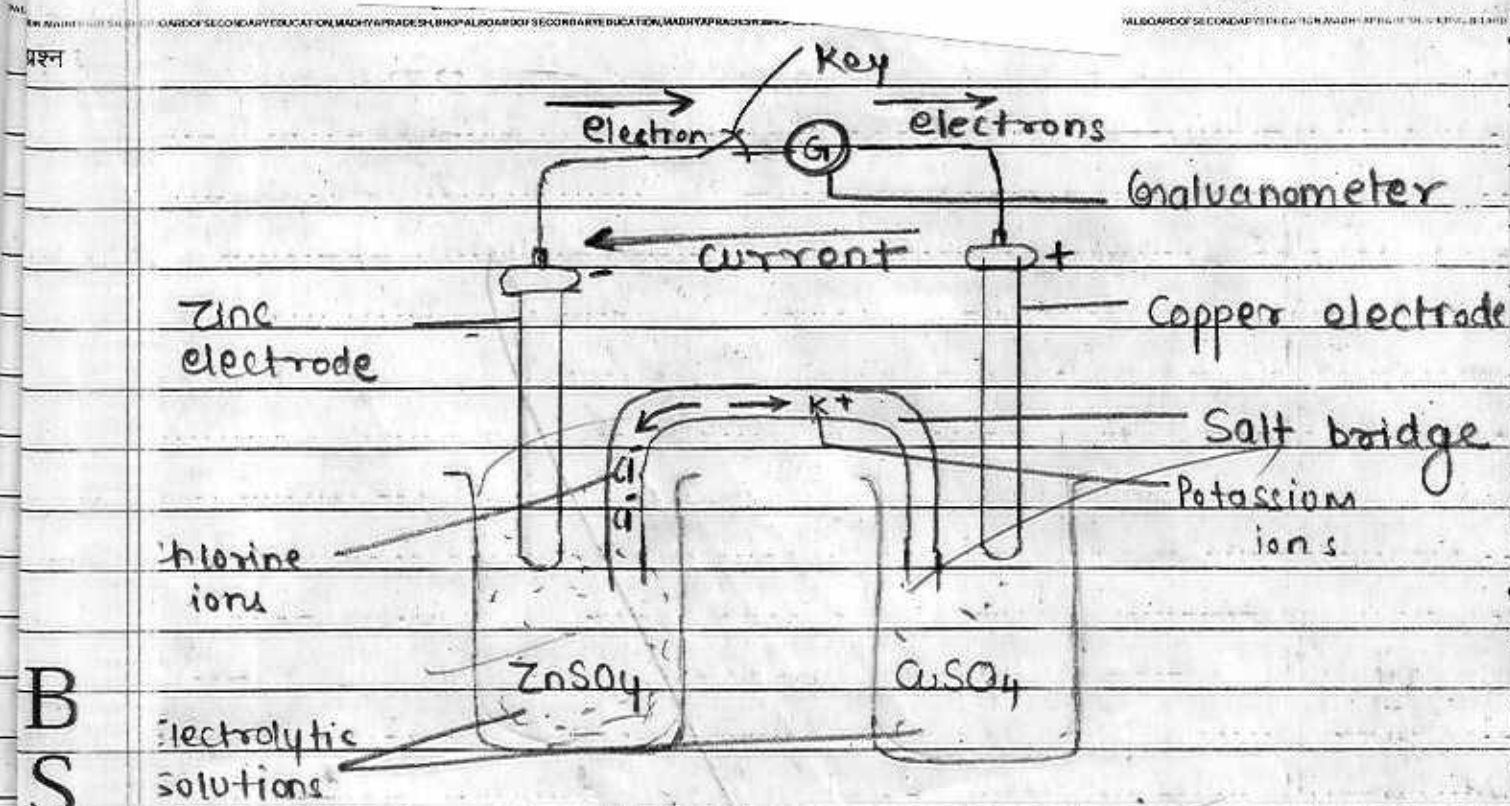
It consists of two electrodes zinc and copper dipped in the electrolytic solution of zinc sulphate and copper sulphate respectively. The two electrolytic solutions are connected internally by a salt bridge which maintains the electrical neutrality and constitutes electric current by completing the path of circuit.

Zinc acts as anode and is a reducing agent. It has a negative potential w.r.t to electrolyte.

Copper acts as cathode and gets reduced. It has a positive potential w.r.t to electrolyte.

The two electrodes are externally connected

B
S
E



Electrochemical cell

The representation of the cell is as follows



B
S
E