माध्यमिक शिक्षा मण्डल, मध्यप्रदेश, भोपाल

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 लगायें

अंकों में   परीक्षार्थी का रोल नम्बर

X	2	3	1	2	2	7	4	0	4

शब्दों में

X Two three one two .... zero four

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प्रश्न पत्र का सेट   A

क :– परीक्षार्थी का कक्ष क्रमांक   03

ख :– परीक्षा का दिनांक   18   03   23

परीक्षा का नाम एवं परीक्षा केन्द्र क्रमांक की मुद्रा

हायर सेकेण्डरी   केन्द्र क्रमांक–122014

पर्यवेक्षक का नाम एवं हस्ताक्षर	केन्द्राध्यक्ष / सहायक केन्द्राध्यक्ष के हस्ताक्षर
Singh	M Carathin

परीक्षक एवं उपमुख्य परीक्षक द्वारा भरा जावे ↓

प्रमाणित किया जाता है कि होलो क्राफ्ट स्टीकर क्षतिग्रस्त नहीं पाया गया तथा अन्दर के पृष्ठों के अनुरूप मुख्य पृष्ठ पर अंकों की प्रविष्टी एवं अंकों का योग सही है।

निर्धारित मुद्रा : नाम, पदनाम, मोबाईल नम्बर, परीक्षक क्रमांक एवं पदांकित संस्था के नाम की मुद्रा लगाएं।

उप मुख्य परीक्षक के हस्ताक्षर एवं निर्धारित मुद्रा	परीक्षक के हस्ताक्षर एवं निर्धारित मुद्रा
एन. के. जैन HHMPI, AS-6020	Prakriti Dubey BX-3059

प्रश्न क्रमांक	पृष्ठ क्रमांक	प्राप्तांक (अंकों में)
1		
2		
3		
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9		
10		
11		
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28		

प्रश्न क्र.

Answer No. 1

Ans (i) $\pi = \dfrac{n RT}{V}$

Ans (ii)   (d) 2

Ans (iii)   (d) ce

Ans (iv)   (c) $+4$

Ans (v)   (a) Finkelstein reaction

Ans (vi)   (b) $RONa$

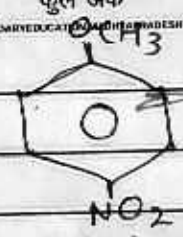Ans (vii)   (c) $CHCl_2 COOH$

Answer No. 2

Ans (i)   55.56

Ans (ii)   0.0 volt

Ans (iii)   violet

Ans (iv)   Ethylenediammine tetraacetato

Ans (V)

CH_3 ... SO_3H and CH_3 ... NO_2

Ans (vii)   more

Ans (vii)   Riboflavin

answer No. 3

Ans (i)   Mn $=$ $+7$

Ans (ii)   Primary valence $=$ Negative ions

Ans (iii)   R – O – R $=$ Ether

Ans (iv)   Hoffmann bromide $=$ Primary amine

Ans (v)   Milk Sugar $=$ Lactose

Ans (vi)   Sucrose $=$ $C_{12}H_{22}O_{11}$

Ans (vii)   Aldohexose $=$ Glucose
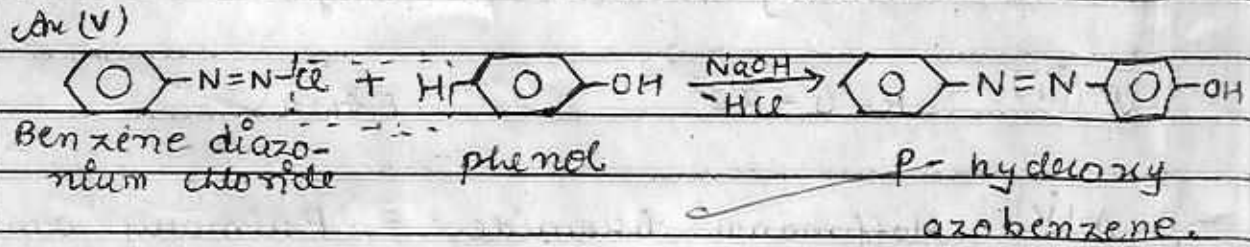
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<u>Answer No. 4</u>

A2(i) $\Lambda_m = K \times V$ or $\Lambda_m = \dfrac{K \times 1000\, cm^3}{C}$

Ans (ii) $mol\ L^{-1} s^{-1}$

Ans (iii)   Electronic configuration of Scandium
is $Sc\ (21) \rightarrow 1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 4s^2$
$3d^1$

Ans (iv)   Dichlorodiphenyl trichloroethane

Ans (v)

Benzene diazo-
nium chloride   phenol   p- hydroxy
                                       azobenzene.

Ans (vi) $C_6H_5 SO_2 Cl$

Ans (vii)   Amino acid

Answer No. 5

Mole Fraction :- It is the ratio of the number of moles of one component to the total number of moles of all component present in the solution. It is represent by X

$$X_A = \frac{n_A}{n_A + n_B}$$

$$X_B = \frac{n_B}{n_A + n_B}$$

$$X_A + X_B = \frac{n_A}{n_A + n_B} + \frac{n_B}{n_A + n_B}$$

$$X_A + X_B = \frac{n_A + n_B}{n_A + n_B}$$

$$\boxed{X_A + X_B = 1}$$

Hence, the sum of moles fraction of all component is 1.

Answer No. 6 (OR)

Faraday's first law of electrolysis :- According to this " the weight of a substance liberated during electrolysis is directly

proportional to the flow of electricity. If W gram of a substance is deposited at electrode on flowing Q coulomb of electricity.

Then,

$$W \propto Q$$

$$W = ZQ$$

Here, Z = electrochemical equivalent

but $Q = It$ If $I = 1A$ & $t = 1 sec.$

Now, $W = ZIt$ then $\boxed{W = Z}$

Hence, electrochemical equivalent may be defined as the weight of a substance deposited at electrode on passing 1 Ampere current in 1 second.

Answer No. 7

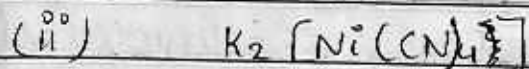| Molecularity of reaction	Order of reaction
① It is the total no. of molecules of reactant participate in reaction.	① It is the no. of molecules of reactant which affect the ~~reot~~ rate of reaction.
② It is theoritical concept.	② It is practical concept.
③ Zero values are not possible.	③ Zero values are possible.

<u>Answer No. 8</u>

(i) $[Co(NH_3)_6]Cl_3$

Ans   Hexaamminecobalt (III) Chloride

(ii) $K_2[Ni(CN)_4]$

Ans   Potassium tetracyanonickelate (II)

<u>Answer No. 9</u>

<u>Coordination number</u> :- The total number of monodentate ligand attached with central metallic ion with coordinate bond in coordination compound is called coordination number.

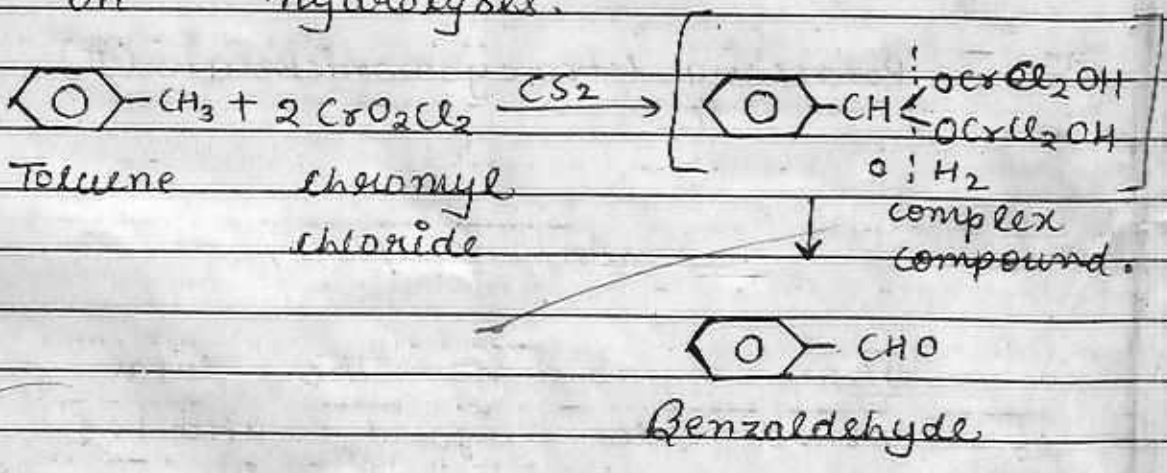This number is to between 2 to 6. Most of compound have coordination number 4 or 6.

<u>Example</u> :- $K_4[Fe(CN)_6]$

Hence, In above example six cyanide is attached to Fe so its coordination number is six.

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Answer No. 10

Etard reaction :- when toluene is treated with chromyl chloride in the presence of carbon disulphide then it form a complex compound which it converted into benzaldehyde on hydrolysis.

Toluene   chromyl
               chloride

complex compound.

Benzaldehyde.

Answer No. 11   OR

ammonia

Amines are basic due to the presence of lone pair of electrons on nitrogen atom. Density of electrons increases on nitrogen

atom of ethyl amine due to positive. inductive effect of ethyl group. So it can easily except proton by donating lone pair of electron. while in ammonia there is no inductive effect Hence, Ethylamine is more basic than ammonia.

Answer No. 12 OR

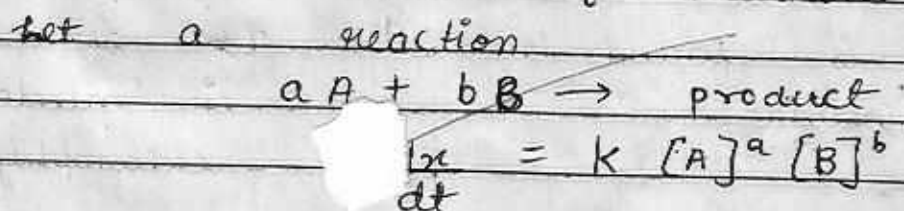| DNA	RNA
① It is deoxyribose sugar.	① It is ribose sugar.
② Thyamine is present	② uracil is present.
③ It has double helix structure.	③ It has single helix structure.
④ It is found in chromosome.	④ It is found in nucleus & chlorophyll.

Answer No. 14 (OR)

(i) <u>Rate determining step</u> :- Some reactions are very fast like ionic reaction but some are very slow like dead slow reaction but in a reaction rate of reaction depends only on slow step these are called rate determining step.

Let

$$R - X \xrightarrow{slow} R^+ + X^-$$

And $R^+ + OH^- \xrightarrow{fast} ROH$

then, rate of reaction $\propto [R-X]$

rate of reaction $= k[R-X]$

(ii) Order of reaction :- The number of molecules of reactants which affect the rate of reaction is called order of reaction.
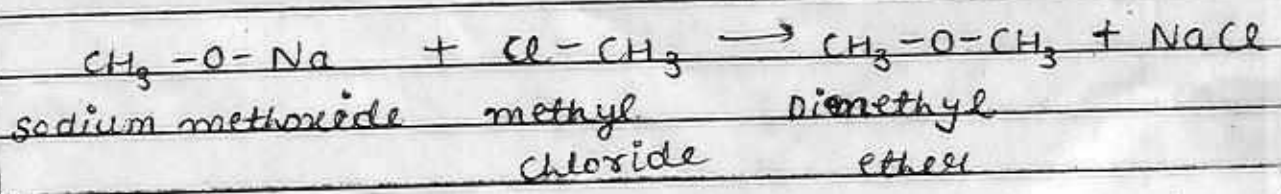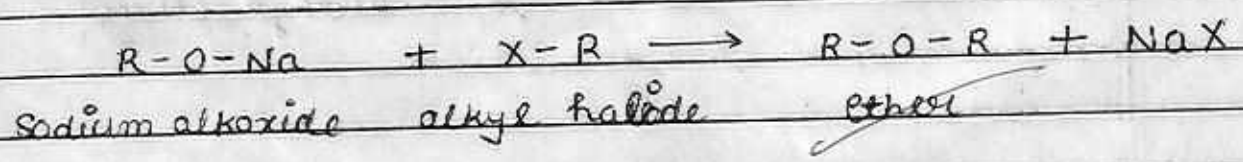
Let a reaction

$$aA + bB \rightarrow product$$

$$\frac{dx}{dt} = k[A]^a [B]^b$$

order of reaction $= a+b$

Answer No. 15

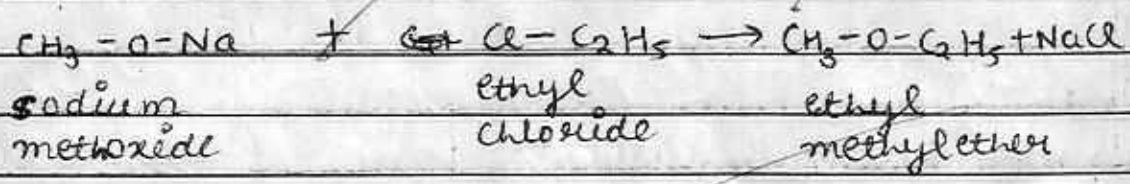| d-block elements	f-block elements
① The elements in which last electron enter in d-orbital are called d-block elements.	① The elements in which last electron enter in f-orbital are called f-block elements.
② General electronic configuration is $ns^{0-2} (n-1) d^{1-10}$	② General electronic configuration is $ns^2 (n-1) d^{0-1} (n-2) f^{1-14}$
③ They are also known as transition elements.	③ They are also known as inner transition elements.

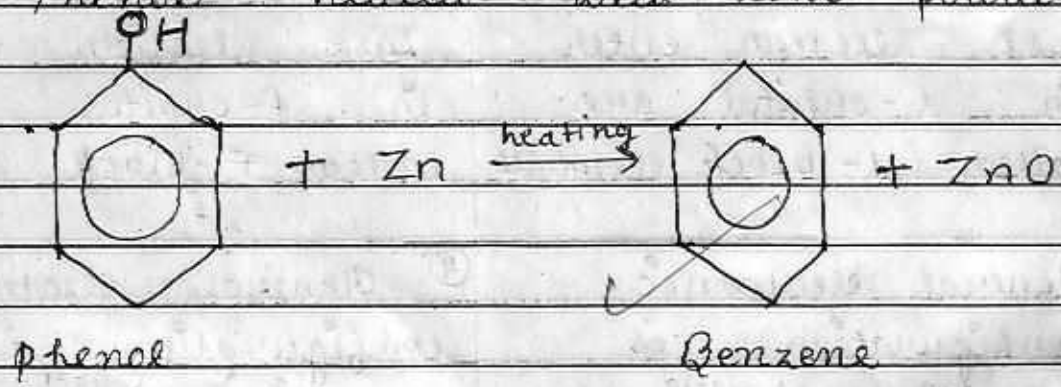## Answer No. 16

(i) Alkyl halide reacts with sodium alkoxide.

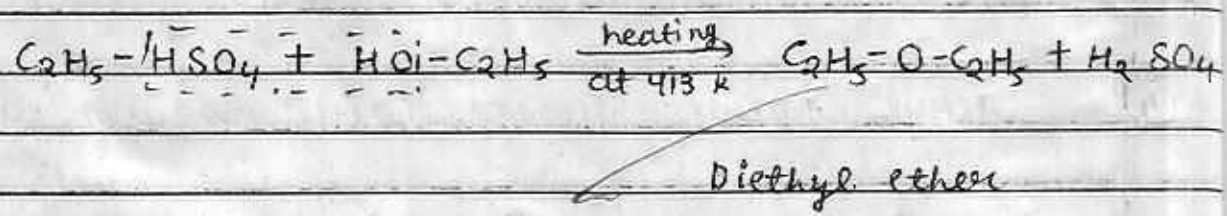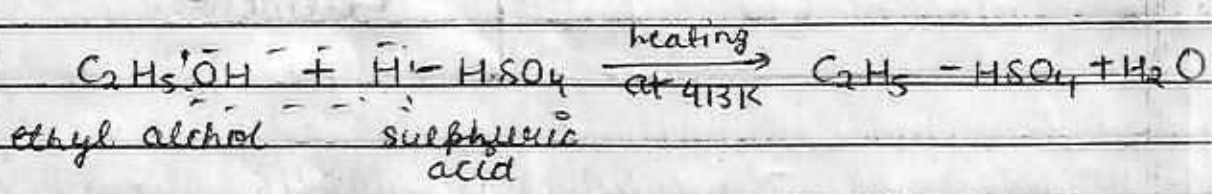$$R-O-Na + X-R \longrightarrow R-O-R + NaX$$
Sodium alkoxide   alkyl halide   ether

$$CH_3-O-Na + Cl-CH_3 \longrightarrow CH_3-O-CH_3 + NaCl$$
sodium methoxide   methyl chloride   Dimethyl ether

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$$CH_3 - O - Na \; + \; Cl - C_2H_5 \longrightarrow CH_3 - O - C_2H_5 + NaCl$$

sodium   ethyl   ethyl
methoxide   chloride   methylether

(ii) Phenol heated with zinc powder.

phenol   Benzene

(iii) Ethyl alcohol is treated with H_2SO_4 at 413 K.

$$C_2H_5 \cdot OH \; + \; H' - HSO_4 \xrightarrow[\text{at 413K}]{\text{heating}} C_2H_5 - HSO_4 + H_2O$$

ethyl alcohol   sulphuric
        acid

$$C_2H_5 - HSO_4 \; + \; HO - C_2H_5 \xrightarrow[\text{at 413 k}]{\text{heating}} C_2H_5 - O - C_2H_5 + H_2SO_4$$

              Diethyl ether
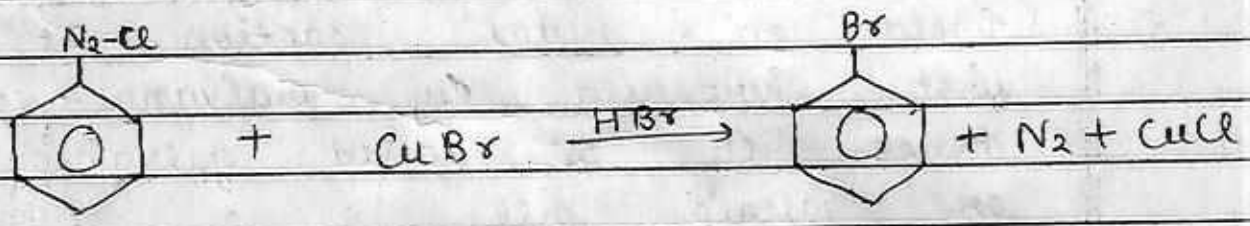
Answer No. 17 (OR)

Sandmeyer's reaction :- when benzene diazonium chloride is react with CuCl + HCl or CuBr + HBr to form haloguenes or halobenzene. This reaction is called Sandmeyer's reaction.
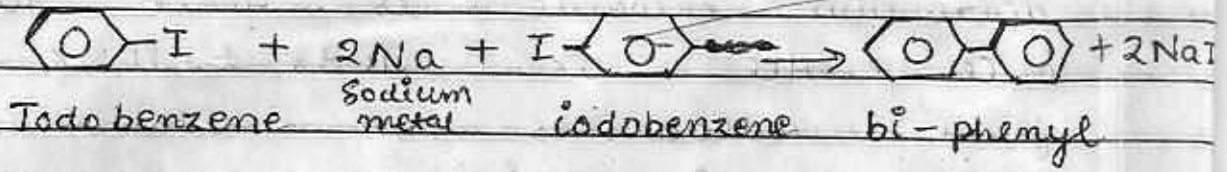

Benzene diazonium chloride + CuCl $\xrightarrow{HCl}$ Chlorobenzene + CuCl + N_2
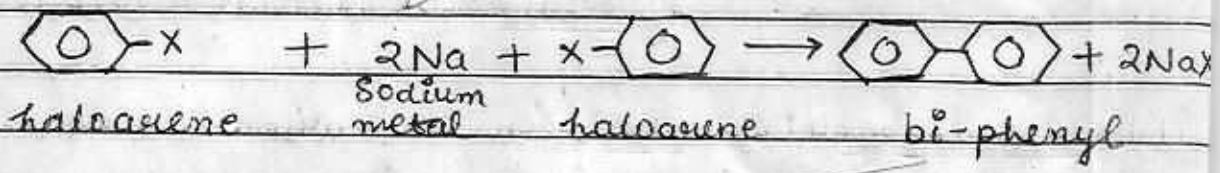

Benzene diazonium chloride + CuBr $\xrightarrow{HBr}$ Bromobenzene + N_2 + CuCl

Fitting reaction :- when haloarenes is react with sodium metal to form bi-phenyl this reaction is called Fitting reaction.

$$\langle O \rangle - X \quad + \quad 2Na + x - \langle O \rangle \longrightarrow \langle O \rangle - \langle O \rangle + 2NaX$$

haloarene   Sodium   haloarene   bi-phenyl
                  metal

$$\langle O \rangle - I \quad + \quad 2Na + I - \langle O \rangle \longrightarrow \langle O \rangle - \langle O \rangle + 2NaI$$

Iodo benzene   Sodium   iodobenzene   bi-phenyl
                  metal

Answer No. 18

Electro-chemical cell :- The device which converts the chemical energy into electrical energy are called electro-chemical cell. Such type of cell based on a redox reaction. It is first introduced by Galvano & voltar hence it is called galvanic cell or voltaic cell.

Example - Daniel cell. — Daniel cell have two half cell $Zn/ZnSO_4$ and $Cu/CuSO_4$ electrode. The two half cells are joined by inverted U - sph saped tube containing KCl & 3% agar - agar solution. U shaped tube is called salt bridge.

Salt bridge joint the two solution

and maintains proper distance between two half cell.

when zinc electrode ~~rod~~ and ~~cu~~ copper electrode are joint externally by a wire and galvanometer then electron flows from zinc electrode to copper electrode and current flowing in opposite direction to electrons.
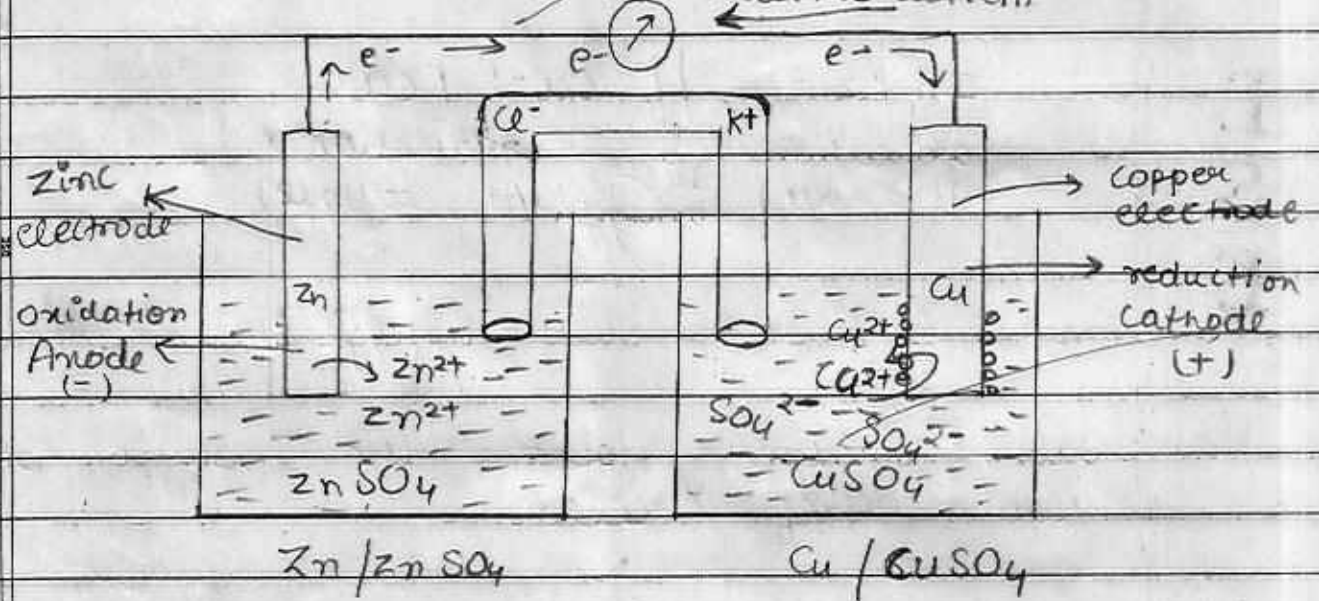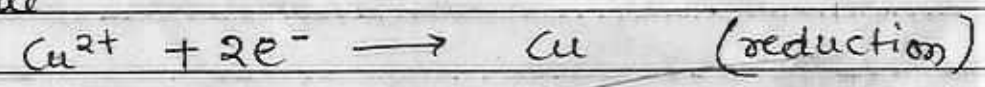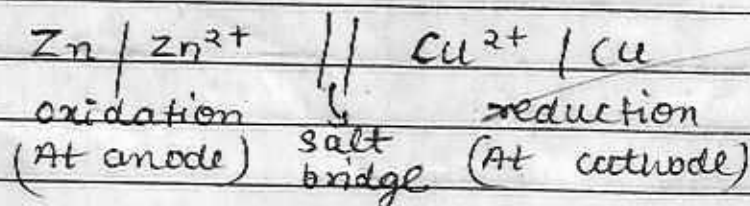

Fig. Daniel cell

At Anode.

$$Zn \longrightarrow Zn^{2+} + 2e^- \quad (oxidation)$$

At Cathode

$$Cu^{2+} + 2e^- \longrightarrow Cu \quad (reduction)$$

Chemical reaction :-

$$Zn \longrightarrow Zn^{2+} + 2e^- \text{ (At Anode)}$$
$$Cu^{2+} + 2e^- \longrightarrow Cu \text{ (At cathode)}$$

$$Zn + Cu^{2+} \longrightarrow Zn^{2+} + Cu$$

Structure :-

$$Zn \mid Zn^{2+} \quad \| \quad Cu^{2+} \mid Cu$$

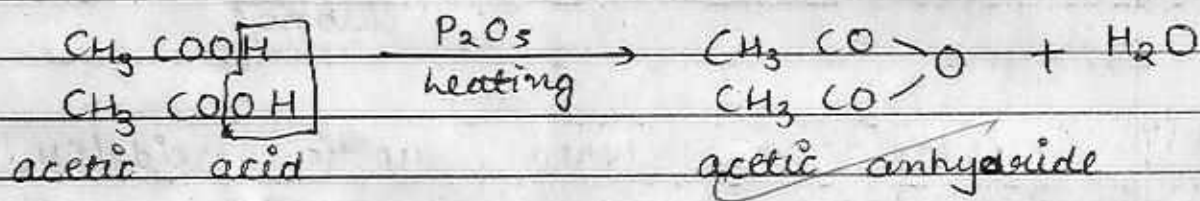oxidation   reduction

(At anode)   salt   (At cathode)
          bridge

Functions of salt bridge :-

① Salt bridge joint the solution b/w two half cells.

② Salt bridge complete the circuit b/w two half cells.

③ It eleminates liquid junction potential

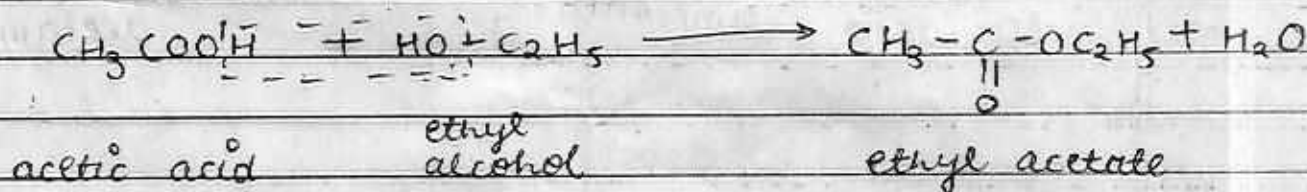योग पूर्व   प्रश्न 17 फ अंक   कुल अंक

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Answer No. 19.

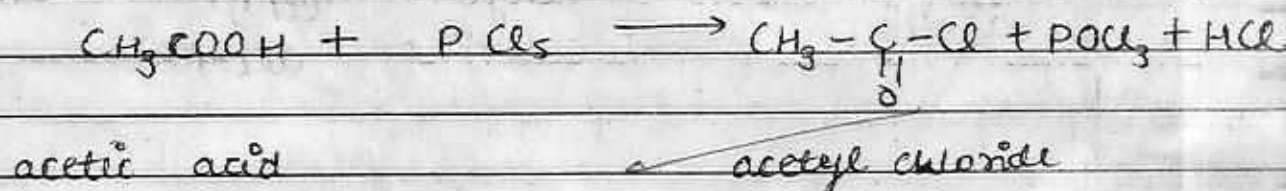(i) <u>Acetic anhydride</u> :- when acetic acid (CH_3COOH) is heated with dehydrating agent such as P_2O_5 & H_2SO_4 to form acetic anhydride

$$CH_3COO\boxed{H} \quad \xrightarrow[\text{heating}]{P_2O_5} \quad \begin{matrix} CH_3CO \\ CH_3CO \end{matrix} \Big> O \; + \; H_2O$$
$$CH_3CO\boxed{O}H$$

acetic acid   acetic anhydride

(ii) <u>Ethyl acetate</u> :- when acetic acid (CH_3COOH) is react with ethyl alcohol to form ethyl acetate.
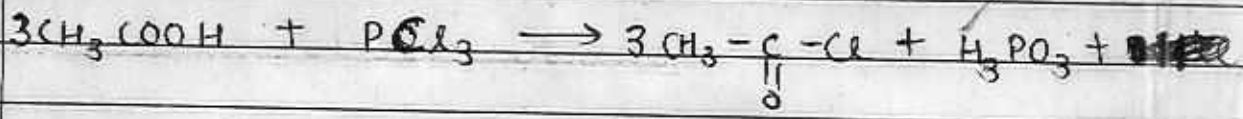
$$CH_3COO\underline{H} \; + \; \underline{HO}+C_2H_5 \; \longrightarrow \; CH_3-\underset{\underset{O}{\|}}{C}-OC_2H_5 + H_2O$$

acetic acid   ethyl alcohol   ethyl acetate

(iii) <u>Acetyl chloride</u> :- when acetic acid (CH_3COOH) is react with PCl_5, PCl_3 and $SOCl_2$ to form acetyl chlorides
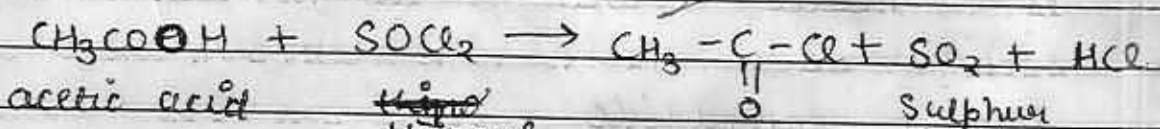
$$CH_3COOH \; + \; PCl_5 \; \longrightarrow \; CH_3-\underset{\underset{O}{\|}}{C}-Cl + POCl_3 + HCl$$

acetic acid   acetyl chloride

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$$3CH_3COOH + PCl_3 \longrightarrow 3CH_3-\underset{\underset{O}{\|}}{C}-Cl + H_3PO_3 + \text{HCl}$$

acetic acid   acetyl chloride

$$CH_3COOH + SOCl_2 \longrightarrow CH_3-\underset{\underset{O}{\|}}{C}-Cl + SO_2 + HCl$$

acetic acid   ~~liquid~~   Sulphur
                thionyl   acetyl   dioxide
                chloride   chloride

(iv) Acetamide :- when acetic acid (CH_3COOH) is react with ammonia to form acetamide.

$$CH_3COOH + NH_3 \longrightarrow CH_3COONH_4 \longrightarrow CH_3\underset{\underset{O}{\|}}{C}-NH_2 + H_2O$$

acetic acid   ammonia ,   acetamide

(v) Ethyl alcohol :- when acetic acid is ethyl ~~bromo~~ chloride to form alcohol

$$CH_3\underset{\underset{O}{\|}}{C}\text{--}OH + C_2H_5Cl \longrightarrow CH_3OH + CH_3-\underset{\underset{O}{\|}}{C}-Cl$$

acetic acid   ethyl   ethyl   acetyl
                chloride   alcohol   chloride

Answer No. 13

Given,

Vapour pressure of pure benzene

$(P_b^o) = 0.850$ bar

mass of solute $(W_B) = 0.5$ gm

mass of solvent (benzene) $(W_A) = 39$ gm

Molecular mass of solvent (benzene)

$(M_A) = 78$ gm/mol

Vapour of pressure of solution $(P_b) = 0.845$

we know that M. mass of solute $(M_B) = ?$

$$\frac{P_b^o - P_b}{P_b^o} = \frac{W_B}{M_B} \times \frac{M_A}{W_A}$$

$$\frac{0.850 - 0.845}{0.850} = \frac{0.5}{M_B} \times \frac{78^2}{39}$$

$$0.005 = \frac{0.5 \times 2}{M_B}$$

$$M_B = \frac{1}{0.005} = \frac{1000}{5}$$

$$M_B = \frac{1000}{5}$$

$$M_B = 200 \text{ gm/mol}$$

Hence, the molar mass of the solid substance is 200 gm mol^{-1}