छत्तीसगढ़ माध्यमिक शिक्षा मण्डल, रायपुर

परीक्षार्थी हेतु

2019

उ. पु. 40 पृष्ठ

प्रश्न पत्र सेट **A, B, C** लिखें — A

पृष्ठ 2 पर दिए गए निर्देश को आवश्यक रूप से पढ़ें।

परीक्षा के नाम की सील

सेकेण्ड्री स्कूल परीक्षा

1. विषय कोड — 2 0 2   2. विषय का नाम — Chemistry

11074

4278905

2	1	9	1	1	1	4	6	3	3
Two	One	Nine	One	One	One	Four	Six	Three	Three

Sanju Sahu
परीक्षार्थी हस्ताक्षर

प्राप्तांक को गोल घेरा करें

प्रश्न संख्या	प्राप्तांक	प्रश्न संख्या	प्राप्तांक	प्रश्न संख्या	प्राप्तांक
1		11	3	21	3
2		12	3	22	
3	1	13	3	23	4
4		14	3	24	5
5	1	15	3	25	5
6	2	16	3	26	5
7	2	17	3	27	
8	2	18	3	28	
9	1	19	3	29	
10	2	20	3	30	

00	1	2	3	4	5	6	7	8	9	10
	11	12	13	14	15	16	17	18	19	20
	21	22	23	24	25	26	27	28	29	30
	31	32	33	34	35	36	37	38	39	40
	41	42	43	44	45	46	47	48	49	50
	51	52	53	54	55	56	57	58	59	60
	61	62	63	64	65	66	67	68	(69)	70
	71	72	73	74	75	76	77	78	79	80
	81	82	83	84	85	86	87	88	89	90
	91	92	93	94	95	96	97	98	99	100

कुल प्राप्तांक अंकों में — 0 6 9   शब्दों में — उन हठ नौ

हस्ताक्षर परीक्षक
परीक्षक क्रमांक — 3101035

हस्ताक्षर उपमुख्य परीक्षक
क्रमांक — 970

हस्ताक्षर मुख्य परीक्षक
क्रमांक

② परीक्षार्थी के लिये निर्देश

1. परीक्षार्थी को 40 पृष्ठ की उत्तरपुस्तिका दी गयी है जिसमें से 38 पृष्ठ छात्रों के लिखने हेतु उपलब्ध रहेंगें। इसी उत्तरपुस्तिका में छात्रों को पूरा प्रश्नपत्र हल करना है। इसके अतिरिक्त अलग से पूरक उत्तरपुस्तिका नहीं दी जायेगी।

2. प्रश्नों को हल करते समय प्रश्न कमांक अंकित करके उत्तर लिखें, प्रश्न लिखना आवश्यक नहीं है। इससे परीक्षार्थी के समय की बचत होगी।

3. परीक्षार्थी अपना रोल नम्बर, विषय कोड, विषय का नाम प्रवेश पत्र से देखकर तथा प्रश्न पत्र सेट प्रश्न पत्र से देखकर एवं माध्यम, दिनांक उत्तरपुस्तिका के मुख्य पृष्ठ पर निर्धारित स्थान पर आवश्यक रूप से अंकित करें।

4. रोल नम्बर सामने दिये उदाहरण अनुसार लिखा जावे:–

1	3	2	4	7	9	5	6	0	1
एक	तीन	दो	चार	सात	नौ	पांच	छः	शून्य	एक

5. उत्तरपुस्तिका के पृष्ठों के दोनों ओर लिखें। बीच में स्थान न छोड़ें। भूल से छूटे हुए पृष्ठ या रिक्त स्थान अथवा अंत में बिना लिखे हुए सभी पृष्ठों को कास (Cross X) कर देंवे।

6. उत्तरपुस्तिका के ऊपर / अंदर तथा किसी भी भाग में चांही गई सूचना के अलावा परीक्षार्थी अपना नाम, पता, फोन नम्बर अथवा अन्य कोई जानकारी जिससे छात्र की पहचान हो सके, अंकित न करें।

7. यदि रफ कार्य हेतु आपको दी गई उत्तरपुस्तिका पर्याप्त है तो उत्तरपुस्तिका के अंतिम पृष्ठों पर रफ कार्य अंकित करके रफ कार्य करें तथा तिरछी रेखा से काट दें। यदि यह उत्तरपुस्तिका पर्याप्त नहीं है तो रफ कार्य हेतु अलग से उत्तरपुस्तिका पर्यवेक्षक से मांगें।

8. परीक्षा केन्द्र पर पुस्तक, लेख, कागज, कैलकुलेटर, मोबाईल, पेजर, किसी भी प्रकार का इलेक्ट्रानिक उपकरण तथा किसी भी प्रकार का हथियार आदि नहीं ले जायें।

9. स्कूल यूनिफार्म, स्केल, कम्पास बॉक्स अथवा अन्य किसी प्रकार से नकल सामग्री लिखकर नहीं लाये। टेबल के आस–पास कोई अवांछनीय सामग्री नहीं होनी चाहिए। नकल करना छत्तीसगढ़ सार्वजनिक परीक्षा (अनुचित साधनों का निवारण) अधिनियम 2008 के तहत दण्डनीय अपराध है।

10. अपनी उत्तरपुस्तिका / ग्राफ / मानचित्र / रफ कार्य पुस्तिका आदि परीक्षा भवन से बाहर ले जाना दण्डनीय अपराध है। अतः परीक्षा समाप्ति पश्चात उत्तरपुस्तिका एवं रफ कार्य पुस्तिका पर्यवेक्षक को सौंपकर परीक्षा कक्ष छोड़ें।

11. निर्देश कमांक 8, 9 एवं 10 का पालन नहीं करने पर अनुचित साधनों के उपयोग के अंतर्गत कार्यवाही की जावेगी।

मूल्यांकनकर्ताओं के लिये निर्देश

1. मूल्यांकनकर्ता उत्तरपुस्तिका का मूल्यांकन लाल स्याही से करेंगे।

2. प्रत्येक पृष्ठ के प्राप्तांक को जोड़कर मूल्यांकनकर्ता अंकों का प्रोग्रेसिव निर्धारित स्थान में लिखना न भूलें एवं जो पृष्ठ कोरे हैं उसे तिरछी लाईन से काट दें तथा उत्तरपुस्तिका के अंतिम पृष्ठ में कुल प्राप्तांक / पूर्णांक लिखना आवश्यक है।

3. मूल्यांकनकर्ता अंकों के योग को मुख्य पृष्ठ पर शून्य से सौ तक दिये गये टेबल में गोल घेरा करें तथा कुल प्राप्तांकों को शब्दों में भी योग लिखें।

4. मैंने सभी प्रश्नों के उत्तरों का मूल्यांकन किया है। उत्तरपुस्तिका के अन्दर के अंक एवं बाहर दर्शाये गये अंक समान हैं एवं योग भी समान है जिसका प्रमाणीकरण मेरे द्वारा मुख्य पृष्ठ पर किया गया है।
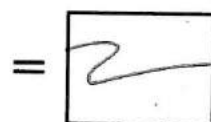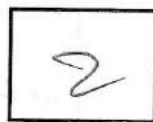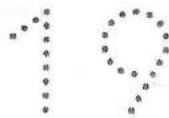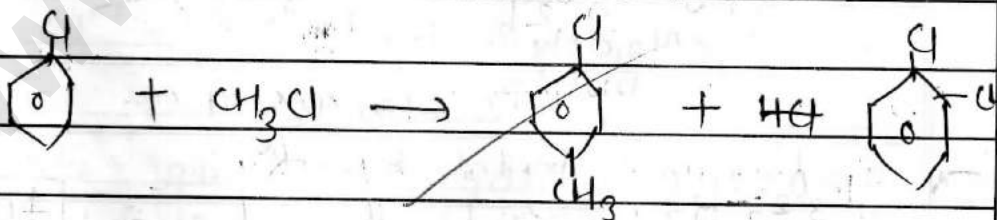
| ANS. NO. - 1 |

1. River water is of colloidal nature, it contain clay and negative changed sand, like Cl^- etc. When the ocean water comes in contact of the river water, the ocean water contain electrolytes, which neutralize the opposite colloidal changed particles and uncharged particles ultimately precipitated and collected at the point, by this way the delta is formed.
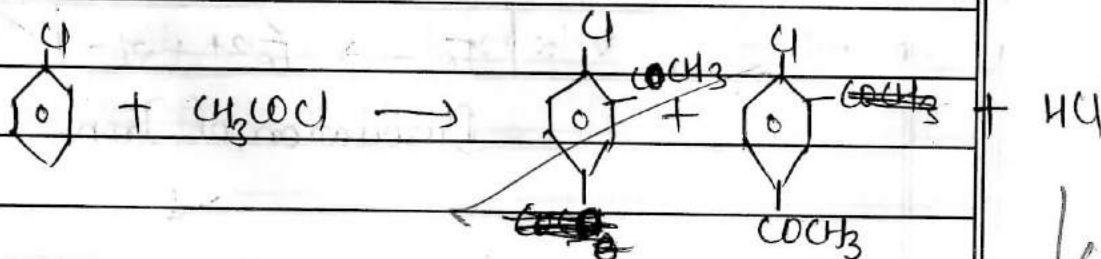
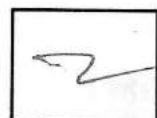2. Fridel craft reaction -

It is of 2 types -

i) Alkylation -

p-cresol.

ii) Acylation -

(ANS. NO. - 24)

24. Corrosion :-

The process of conversion of metals into unwanted compound due to presence of air and moisture in the atmosphere, is called as corrosion.

* Example -

Rusting of Iron ($Fe_2O_3 \cdot 3H_2O$)

* Mechanism of Corrosion of Iron -

$2Fe(OH)_3$

$2Fe(OH)_3 + H_2O + \frac{1}{2}O_2$

Atmospheric air and mosphere.

$Fe_3O_2 \cdot 3H_2O$

$2OH^-$

$2 \times e$

$\frac{1}{2}O_2 + H_2O$

Atmospheric air and moisture

$2e^-$

$Fe \longrightarrow Fe^{2+} + 2e^-$

Dissociation of Iron -
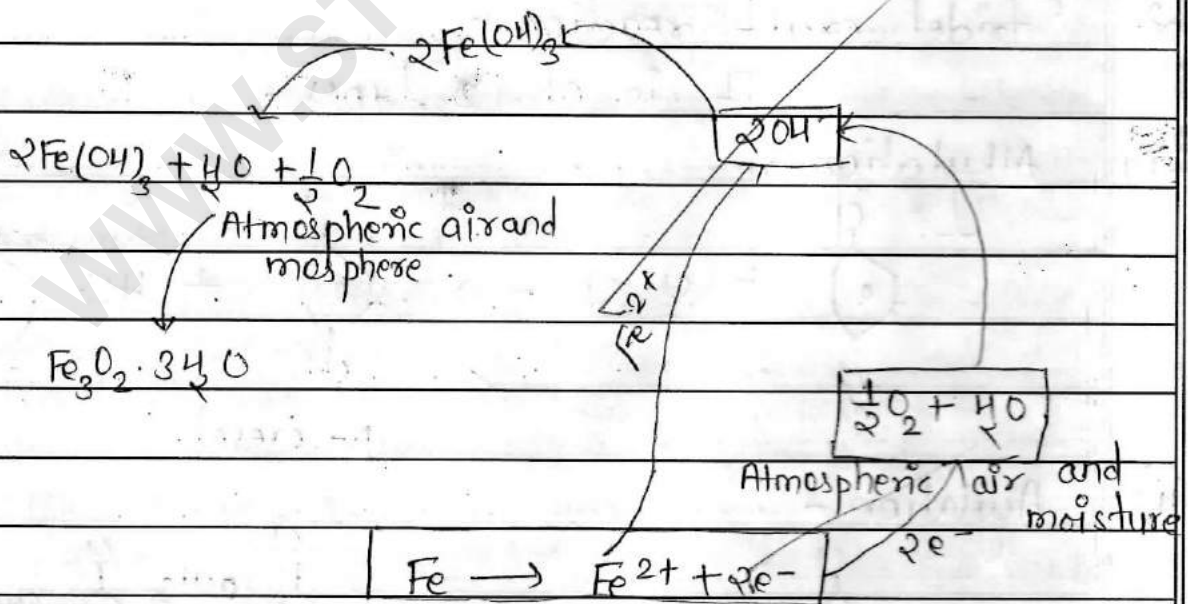
Steps of Mechanism —

Firstly we take a pure Iron in open atmosphere in the presence of air and moisture.

i) Firstly a pure iron is dissociates into their ion and form ferrous ion.

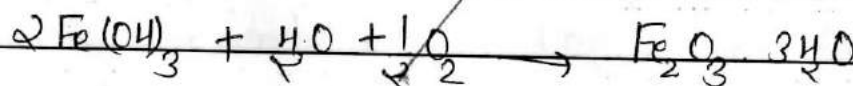$$Fe \longrightarrow Fe^{2+} + 2e^-$$
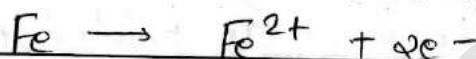
ii) When atmospheric air and moisture has taken those two electron and forms hydroxyl

$$H_2O + \frac{1}{2}O_2 + 2e^- \longrightarrow 2OH^-$$
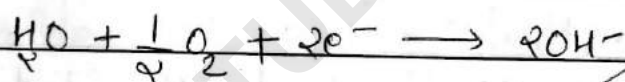
iii) When the hydroxyl is taken ferrous ion and forms their ~~fe hy~~ ferric hydroxide.

$$2OH^- + Fe^{2+} \longrightarrow 2Fe(OH)_3$$
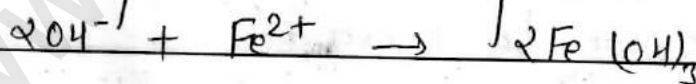
iv) When the again ferric hydroxide is reacted with the atmospheric air and moisture and forms rusting of iron $Fe_2O_3.3H_2O$.

$$2Fe(OH)_3 + H_2O + \frac{1}{2}O_2 \longrightarrow Fe_2O_3.3H_2O$$
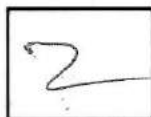
* Prevention of Corrosion –
1. Barrier method.
2. Sacrificial method

1. Barrier method :–
     It is method of prevention of the corrosion of the metals, in which method the surface of the metal is painted on by paints colour or grease or varnishes, by + which the surface remain unaffected.
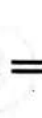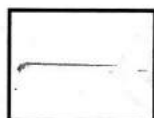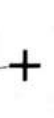
2. Sacrificial method :–
     In this method, the electropositive (Zn) metals or elements are coated over the surface of the iron metal, by which the corrosion of metals can be prevented.
     The process of coating of surface of the iron metal by zinc metal is called as galvanization.
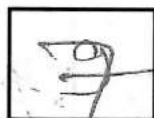
[ANS. NO. – 25]

25 Lanthanide Contraction :–

With increase in atomic number of the lanthanoids, there is steady decreasing in the atomic size and ionic radii of the lanthanoids, is called as lanthano

25.

* Causes of lanthanide contraction are –

i) In lanthanides, the valence or last electrons are being added to its $(n-2) f$ orbitals not to the outershell, due to which the attraction force between the nucleus and electrons are

strong, which causes the contraction of the elements.

ii) The screening effect of the f orbitals electrons are minimum, because the shape of f-orbital is not favourable for screening effect, which cause the contraction of lanthanide.

* Consequences of lanthanide contraction :-

i) Change in the property of the lanthanide :-
Due to the lanthanide contraction, all most the, atomic size and ionic radii of the lanthanide and also their properties become similar, due to which the isolation of the lanthanide is difficult.

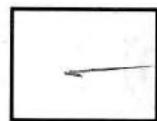ii) Change in the property of the other elements :-
Due to the lanthanide contraction, the properties of the other elements are too much affected, which create a difficulty in the identification of the elements.
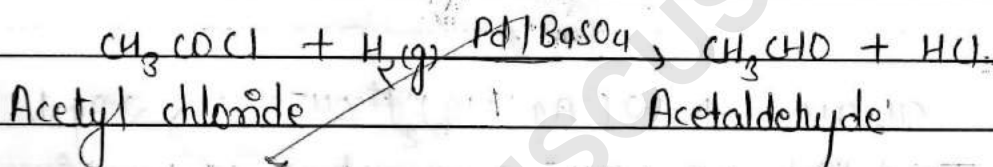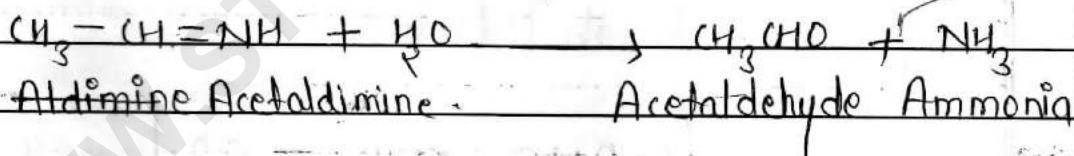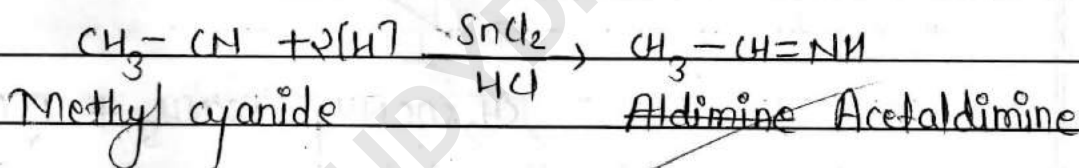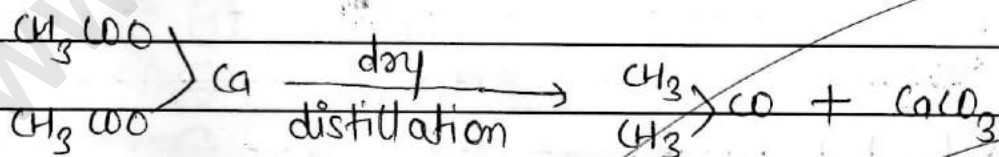
[ANS. NO. — 26]

26. i) When acetyl chloride is treated with hydrogen gas in the presence of Pd in $BaSO_4$, then it forms acetaldehyde and hydrochloric acid.

$$CH_3COCl + H_{2(g)} \xrightarrow{Pd/BaSO_4} CH_3CHO + HCl$$
Acetyl chloride   Acetaldehyde

ii)

$$CH_3-CN + 2[H] \xrightarrow[HCl]{SnCl_2} CH_3-CH=NH$$
Methyl cyanide   ~~Aldimine~~ Acetaldimine

$$CH_3-CH=NH + H_2O \longrightarrow CH_3CHO + NH_3$$
~~Aldimine~~ Acetaldimine   Acetaldehyde Ammonia

iii)

$$\begin{array}{c} CH_3COO \\ CH_3COO \end{array}\Big\rangle Ca \xrightarrow[distillation]{dry} \begin{array}{c} CH_3 \\ CH_3 \end{array}\Big\rangle CO + CaCO_3$$

Calcium acetate   Acetone   Calcium carbonate.

iv)

$$CH_3CHO + CH_3CH_2OH \xrightarrow{H4} CH_3COOC_2H_5$$
Acetaldehyde Ethyl   Ethyl acetate.
                     alcohol.

05

v)

$$CH_3CHO + 2[Ag(NH_3)_2]^+ OH^- \longrightarrow 2Ag\downarrow +$$
Acetaldehyde Tollens reagent   Silver mirror

$$CH_3COONH_4 + 2NH_3 + H_2O$$
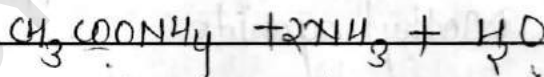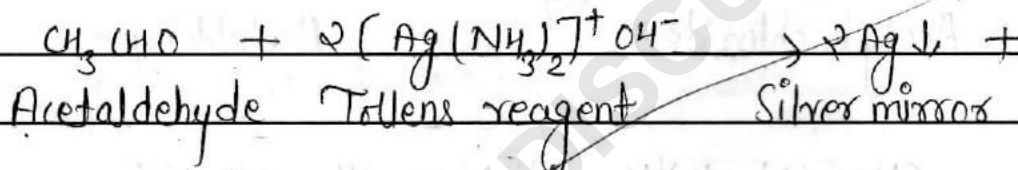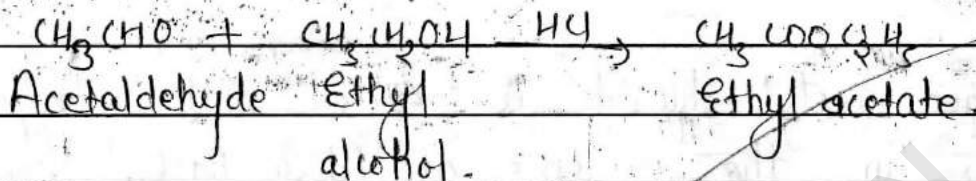
(ANS. NO. — 23)

OR 23.

@ | Frenkel defect !-

Frenkel defect is a kind of stoichio-
metric defect, it is arises due to vacancy
at cation, and this cation moves into
interstitial space , due it is called as
frenkel defect.

In this kind of defect, the density of the crystal remain unchange.

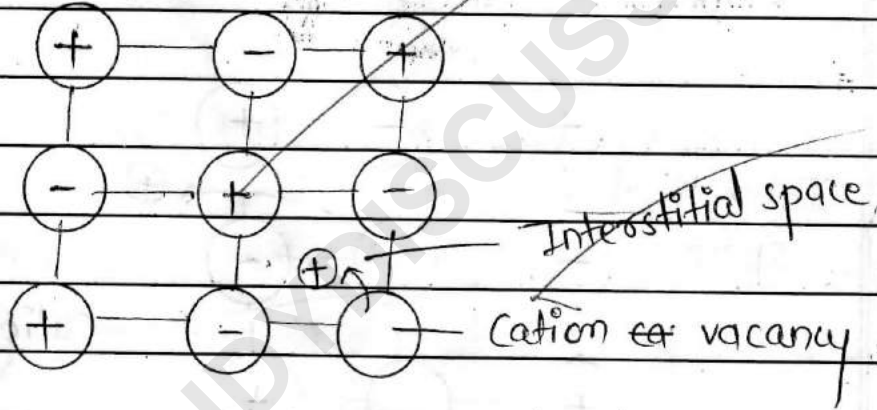This kind of the defect occurs in the ionic compound with the higher co-ordination number. eg — Na AgBr

fig : Frenkel defect.

Where,

$\oplus$ = Anion.

$\ominus$ = Cation

O = Cation vacanty

b.

Schottky defect :-

It is a kind of a stoichiometric defect, which is arises due to the vacancy at the cation and anion site, is called as schottky defect.

In this defect, the density of the crystal becomes decreases.

This kind of defect occurs in the ionic compound with the lower co-ordination number.
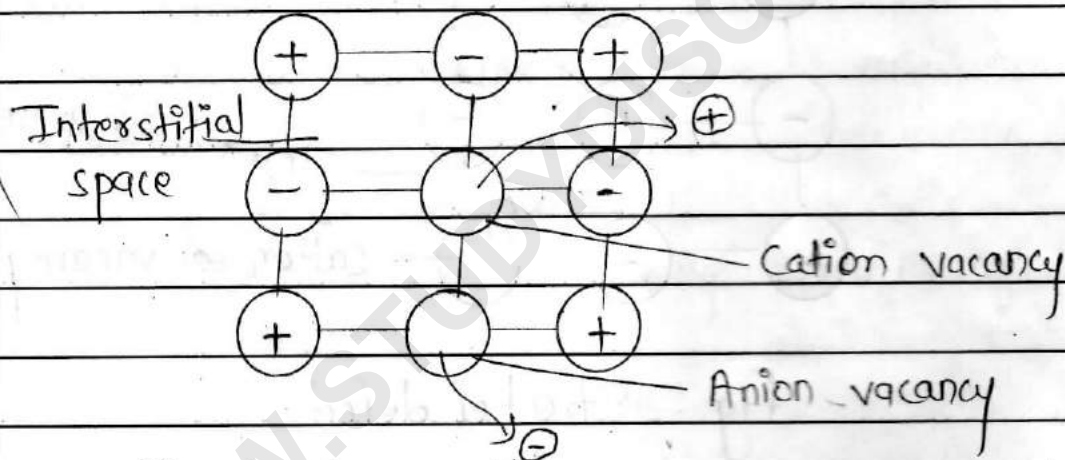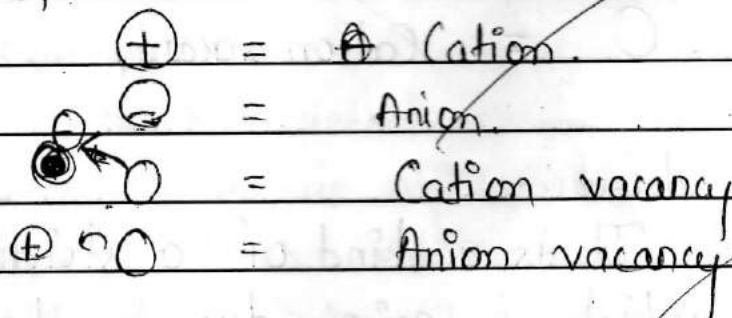
Example - NaCl.

Interstitial space

Cation vacancy

Anion vacancy

fig : Schottky defect.

Where,

$(+)$ = Cation.
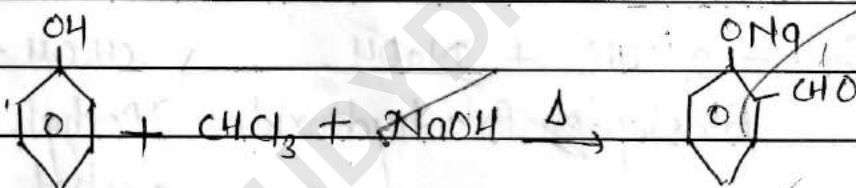
$\bigcirc$ = Anion.
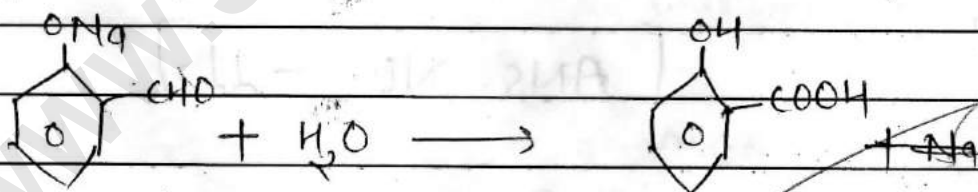
= Cation vacancy

= Anion vacancy

[ANS. NO. — 19]

19.a. Reimer - Teimann reaction —

When phenol is treated with the chloroform in the presence of the potassium sodium hydroxide, then the intermediate compound is formed, which on hydrolysis gives salicylic acid, it is called as Reimer - Teimann reaction.

Phenol   Chloroform   Na hydroxide   Intermediate compound.

$+ CHCl_3 + NaOH \xrightarrow{\Delta}$

Intermediate comp. $+ H_2O \longrightarrow$ Salicylic acid.

(b) Gattermann reaction —

When the benzene diazonium chloride is treated in the presence of the Cu/HCl, then the benzene chloride and N_2 gas is formed, is called as gattermann reaction.

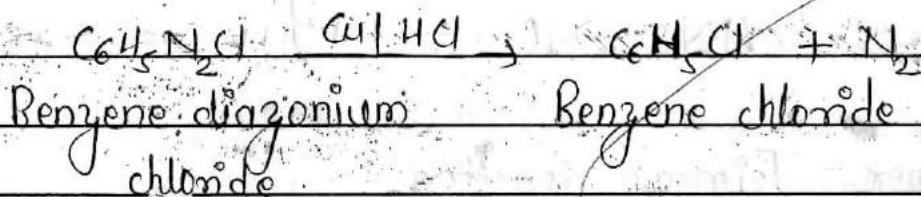$$C_6H_5N_2Cl \xrightarrow{Cu/HCl} C_6H_5Cl + N_2$$

Benzene diazonium   Benzene chloride
chloride
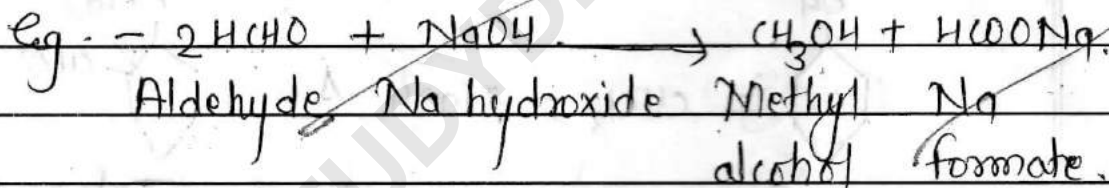
c. Cannizzaro reaction :-

When aldehyde compound is treated with NaOH or KOH then the acid and formate compound is obtained called as cannizzaro reaction.

E.g. - $2HCHO + NaOH \longrightarrow CH_3OH + HCOONa$

Aldehyde Na hydroxide Methyl   Na
alcohol   formate.

[ANS. NO. - 11]

11. Mole fraction of ethylene glycol = 20%
Water = 80 g

Total mole fraction of solution = 20 + 80
= 100 gm

Now, Molar mass of $C_2H_6O_2$ = 12*

$$12 \times 2 + 6 + 2 \times 16$$

$$= 62 \ g \ mol^{-1}$$

Moles of $C_2H_6O_2$ = $\dfrac{20}{62}$

$$= 0.322 \ moles.$$

Moles of Water = $\dfrac{80}{18}$

$$= 4.44$$

Mole fraction of $C_2H_6O_2$ = $\dfrac{0.322}{0.322 + 4.44}$
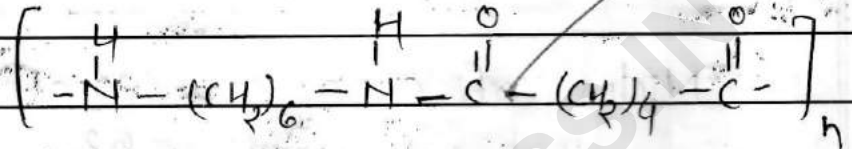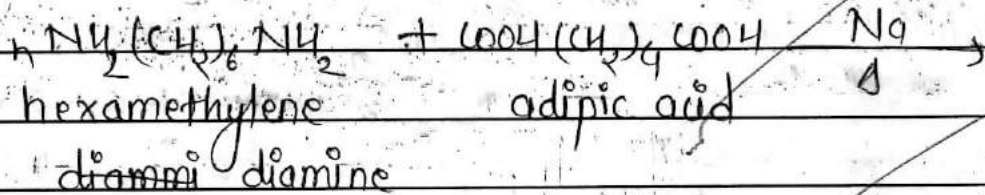
$$= 0.06 \ mol. \ Ans$$

[ANS. NO. — 21]

21. Prepenation of 6,6 Nylon —

Nylon-6,6 is prepared by the condensation polymerization of hexamethylene diammine and adipic acid with the releasing of the water in the presence of Na metal.

$$n\, NH_2 (CH_2)_6\, NH_2\; +\; COOH (CH_2)_4\, COOH \xrightarrow[\Delta]{Na}$$

hexamethylene   adipic acid

diammi diamine

$$\left[-\overset{H}{N} - (CH_2)_6 - \overset{H}{N} - \overset{O}{\overset{\|}{C}} - (CH_2)_4 - \overset{O}{\overset{\|}{C}} - \right]_n$$

Nylon - 6,6

Uses -

i) It is used in coating pipes.

ii) In making toys.

[ANS. NO. - 22]

22. Antibiotics :-

Antibiotics are the drugs, which are prepared by the micro-organism to destroyed the other or harmful micro-organisms , are called as antibiotics.

Example -

i) Penicilline.

ii) Streptomycine.

[ANS. NO. – 18]

18   <u>SN² Reaction :–</u>

It is a bimolecularity nucleophilic substitution reaction.

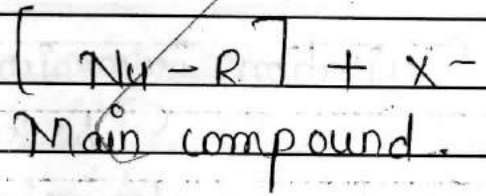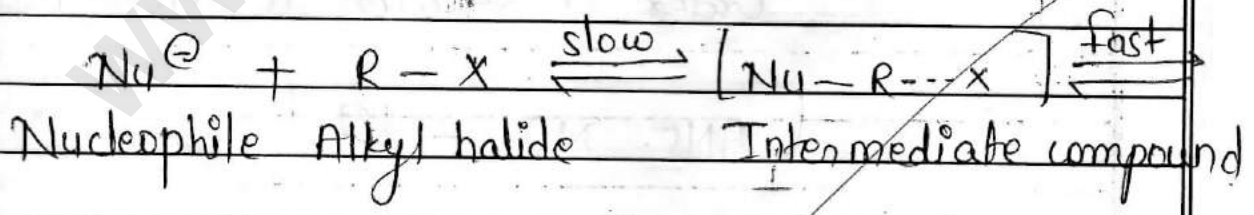It is completed in 1 step, because in this reaction strong nucleophile is used,

<u>Mechanism –</u>

C
G
B
S
E

*   <u>Step – 1 :–</u>

In this reaction strong nucleophile is treated with alkyl halide, by which the intermediate compound is formed which later forms the main compound.

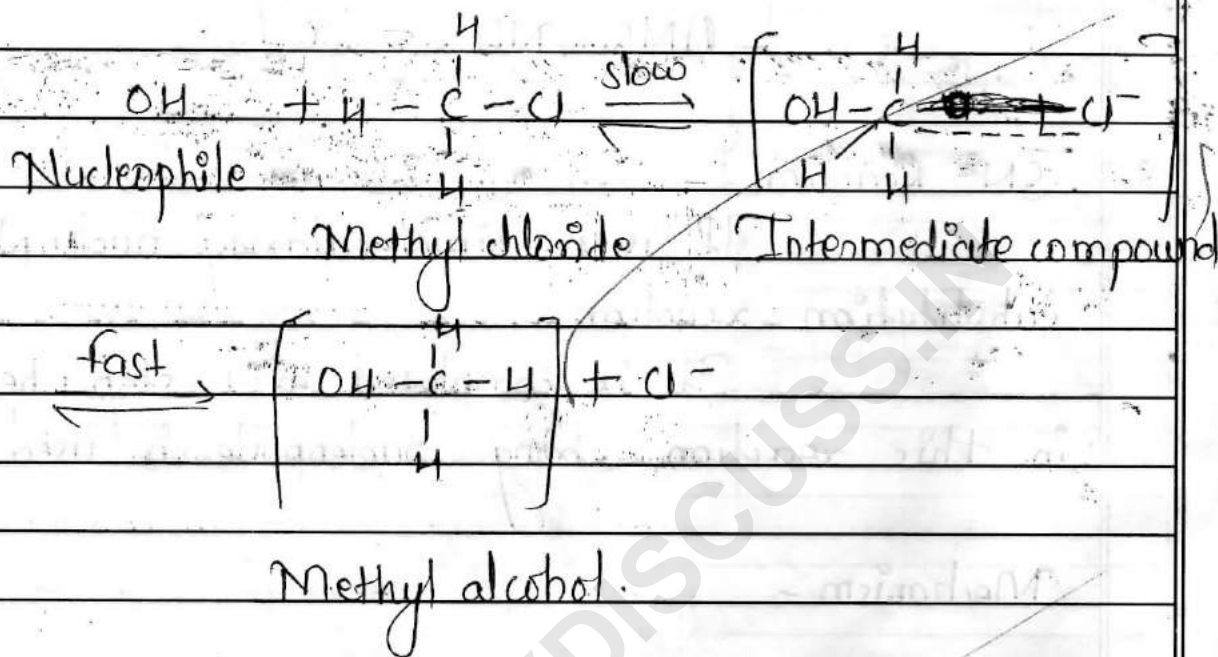$$Nu^{\ominus} + R-X \underset{slow}{\rightleftharpoons} [Nu-R\cdots X] \overset{fast}{\rightleftharpoons}$$

Nucleophile   Alkyl halide   Intermediate compound

$$[Nu-R] + X^-$$

Main compound.

<u>Example –</u>

$$OH + H-\overset{\overset{H}{|}}{\underset{\underset{H}{|}}{C}}-Cl \xrightarrow{slow} \left[OH-\overset{\overset{H}{|}}{\underset{\underset{H}{|}}{C}}-Cl\right]$$

Nucleophile

Methyl chloride   Intermediate compound

$$\xrightarrow{fast} \left[OH-\overset{\overset{H}{|}}{\underset{\underset{H}{|}}{C}}-H\right] + Cl^-$$

Methyl alcohol

In this reaction, the attack of nucleophile is only possible from the back side therefore, it is a inverted reaction. Order of their reactivity is $1° > 2° > 3°$ and in this reaction carbocation is formed. Order of reaction is second order.

(ANS. NO. — 17)

17. i) Ionisation isomerism :—
        Such substances, which on dissolving in the water gives different ions, then the compound obtained is called as ionisation isomerism.

The exchanges of the ions from the complex of any co-ordinate compound.

Example - $[Ni(CO)_3Cl]Br^-$ and $[Ni(CO)_3Br]Cl^-$

ii) Linkage isomerism :-

The isomerisms of the complex, due to different electron donating site of same ligands, is called as linkage isomers.
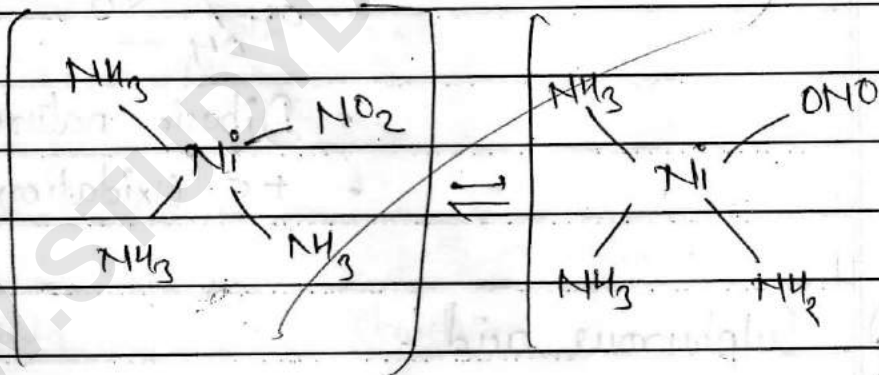
$$[ANS.\ NO. - 16]$$

16. Flourine shows only -1 oxidation state while other halogen show $+1, +3, +5, +7$ oxidation state because flourine cont doesn't contain d-orbitals, because of its small structure and very high electronegativity.

[ANS NO - 15]

15. Oxoacids of sulphur are -

i) Sulphuric acid -

Formula	Structure

H_2SO_4
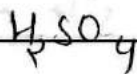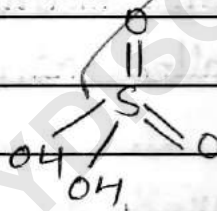
- Dibasic nature
- +5 Oxidation no.

ii) Sulphurous acid -

Formula	Structure

H_2SO_3
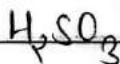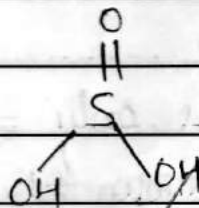
- Dibasic
- +5 Oxidation no.

iii) Thiosulphuric acid –

Formula   Structure
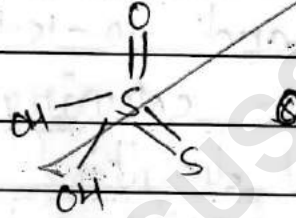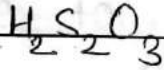
$H_2S_2O_3$

- Dibasic nature
- +5 Oxidation

iv)

Formula   Structure

[ANS. NO. — 03]

3. Denatured alcohol :-

It is a mixture of 90% ethanol and 10-15% of pyridiene or any any other colouring matter. By which the , it doesn't remain as beverage, therefore this mixture is called as denatured alcohol.

[ANS NO. — 4]

4. IUPAC name of CH_3COCH_3 is Propanone (acetone).

[ANS. NO. — 5]

5. Example of monosaccharides are :-
Glucose , Fructose .

[ANS. NO. — 6]

6. Molality :-

The number of the moles of the solute particles, which are dissolve

in the 1 kg of solvent, is called as molality

Formula :

$$m = \frac{nB}{V(litre)}$$

$$m = \frac{WB}{MB} \times \frac{1000}{WA(ml)}$$

[ANS. NO. - 7]

7. **Zero order reaction :-**

In zero order reaction the rate ~~concentration of the reaction~~ re of the reaction is independent of the concentration of the reactant, and the rate of the reaction is directly proportional to the zero power of the concentration of the first reactant.

Suppose,

$$aA \longrightarrow Product$$
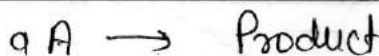
So, rate of reaction $\propto [A]^a$

$$r = k[A]^a$$

For instantaneous rate of reaction

$$r_{inst} = -\frac{d[A]^\circ}{dt}$$

[ANS. NO. - 9]

9. Aniline is insoluble in water, but soluble in HCl because, The aniline is of basic nature due to which it react with HCl strong acid and forms soluble salt but such reaction doesn't having with water.
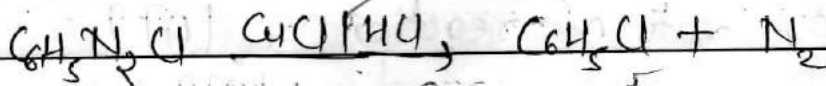
[ANS. NO. - 10]

10. Sandmayer reaction :-
When benzene diazonium salt is treated in the presence of cuprous halid, then the benzene chlor + salt and N_2 gas is formed, called as sandmayer reaction.

Eg -

$$C_6H_5N_2Cl \xrightarrow{CuCl/HCl} C_6H_5Cl + N_2$$

(ANS. NO. – 13)

13. Difference between lyophilic and lyophobic sol

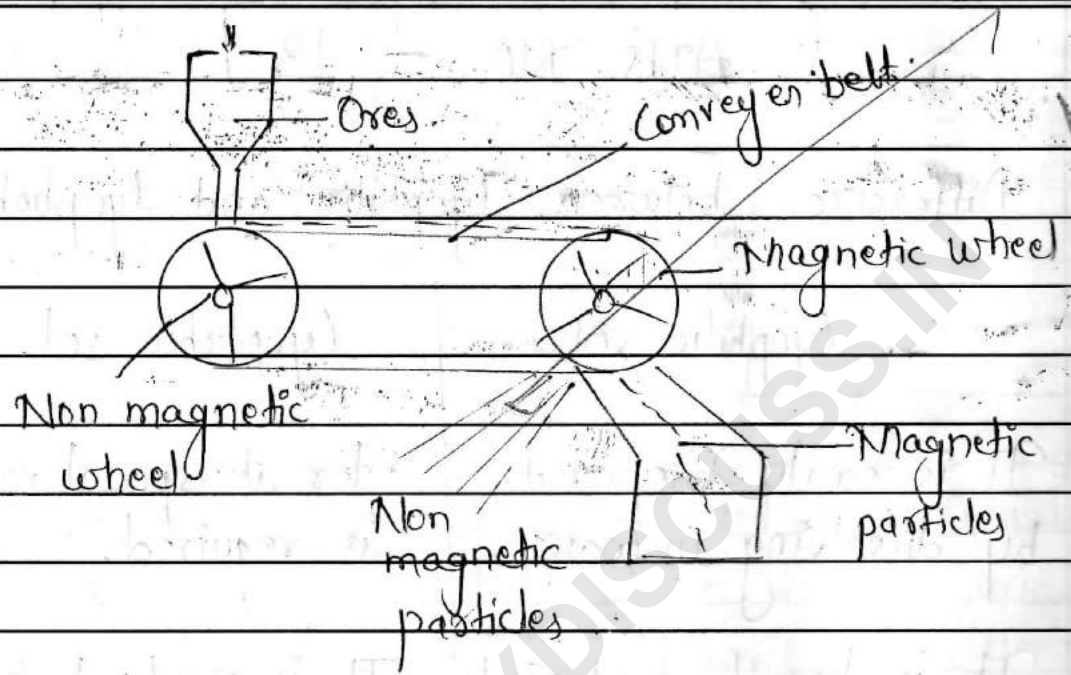| Lyophilic sol	Lyophobic sol.
i) It is easily prepared by dissolving in water.	For it special method is required.
ii) It is heavily hydrated	It is poorly hydrated.
iii) No much effect of electrolyte	Electrolyte quick cause precipitate.
iv) Eg – Starch.	Eg – Au sol

(ANS. NO. – 14)

14. Magnetic separation method :–

Ores — Conveyer belt — Magnetic wheel — Magnetic particles — Non magnetic wheel — Non magnetic particles
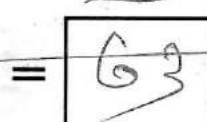
In this method two wheels are used one of which is magnetic in nature and other is non-magnetic nature, which are moving through conveyer belt. Ore is poured in the non magnetic wheels side. Ore is moving through conveyer belt, and magnetic ores are collected near the magnetic wheel but the non magnetic ore moves forway.

By which magnetic ores are obtained.
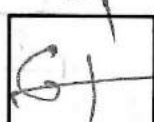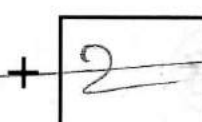
(ANS. NO. — 8)

8 The ionization energy of inert gases is too high because in the inert gases their octate is completely full filled no any other spaces is having for other incoming electrons.

They don't require any other oth electrons.

(ANS. NO — 12)

12. Half period of first order reaction is independent of the initial conc. of reactant

We know that, in case of half life period

$$t = t_{\frac{1}{2}}$$

$$[A]_t = \frac{[A]_0}{2}$$

So we have formula.

$$k = \frac{[A]_0 - [A]_t}{t}$$

So, $k = \dfrac{[A]_0 - \dfrac{[A]_0}{2}}{\dfrac{t}{2}}$
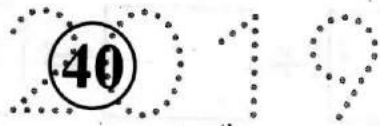
$k = \dfrac{2[A]_0 - [A]_0}{\dfrac{2t}{2}}$

$k = \dfrac{[A]_0}{\dfrac{2t}{2}}$

$$\boxed{t_{1/2} = \dfrac{[A]_0}{2k}}$$

It is proved, that the order of reaction is independent of the initial conc. of the reactant, it only depend on the value of (k) rate constant.

(ANS. NO. - 20)

20. Peptide linkage -

The linkage formed between NH and co in the amino acid by the elimination of water called as peptide linkage.

$$NH_2 - CH_2 - COOH + NH_2 - CH_2 - COOH \longrightarrow$$

Amino acid   Amino acid.

$$NH_2 - CH_2 - CO - NH - CH_2 - COOH$$

$\vee$

Peptide linkage.

Zwitter ion :-

The ion formed by the donation of proton by the COOH group and it is accepted by NH₂ group and forms COO⁻ carboxylate ion and NH_3^+ ammonium ion. such ion is called as zwitter ion.

$$NH_2 + \underset{R}{C} - COOH \xrightarrow{\underset{\longleftarrow}{H^+}} \underset{R}{NH_3^+} - C - COO^-$$

Zwitter ion.

C
G
B
S
E

69/70