2020

मा[illegible]क्षा मण्डल, मध्यप्रदेश, भोपाल

परीक्षार्थी द्वारा भरा जावे ↓

CHEMISTRY 2 2 0 English

स्टीकर तीर के निशान ↓ से मिलाकर लगायें

0327754

उत्तर पुस्तिका का सरल क्रमांक: 320-

अंकों में परीक्षार्थी का रोल नम्बर: 2 0 1 4 3 9 1 7 6

शब्दों में [illegible]

परीक्षार्थी कृपया ध्यान रखें

नीचे दिये गये उदाहरण अनुसार रोल नम्बर भरें।

उदाहरणार्थ	1	1	2	4	3	9	5	6	8
	एक	एक	दो	चार	तीन	नौ	पांच	छ	आठ

केन्द्राध्यक्ष / सहायक केन्द्राध्यक्ष परीक्षक द्वारा भरा जावे

क :– पूरक उत्तर पुस्तिकाओं की संख्या अंकों में [X] शब्दों में [X]

ख :– परीक्षार्थी का कक्ष क्रमांक 16

ग :– परीक्षा का दिनांक 09 06 2029

परीक्षा का नाम एवं परीक्षा केन्द्र क्रमांक की मुद्रा

हायर सैकेण्डरी परीक्षा केन्द्र क्र 142065

पर्यवेक्षक का नाम एवं हस्ताक्षर	केन्द्राध्यक्ष / सहायक केन्द्राध्यक्ष के हस्ताक्षर
[illegible]	[illegible]

परीक्षक एवं उपमुख्य परीक्षक द्वारा भरा जावे ↓

परीक्षक एवं उपमुख्य परीक्षक द्वारा भरा जावे

प्रमाणित किया जाता है कि मूल्यांकन के समय पूरक उत्तर पुस्तिकाओं की संख्या उपरोक्तानुसार सही पाई गई तथा कवर 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
राकेश चौधरी व्याख्याता (रसायन) शास. उ.मा. विद्यालय सागौर DHTWD/220/4520	भारत जेडिया वरिष्ठ अध्यापक शा. उ.मा.वि. नागदा DHTWD/220/4556

नोट :– "हायर सेकेण्डरी परीक्षा में केवल वाणिज्य संकाय के विषयों तथा हाईस्कूल परीक्षा में प्रायोगिक विषय को छोड़कर शेष विषयों हेतु नियमित एवं स्वाध्यायी छात्रों के लिये प्रश्न पत्र 100 अंकों का होगा किन्तु नियमित छात्रों को 100 अंक के प्राप्तांक का 80% अधिभा एवं स्वाध्यायी छात्रों को 100 अंक के प्राप्तांक ही अंकसूची में प्रदर्शित किये जायेंगे।"

केवल परीक्षक द्वारा भरा जावे।

प्रश्न क्रमांक के सामुख प्राप्तांकों की प्रविष्टी करें

प्रश्न क्रमांक	पृष्ठ क्रमांक	प्राप्तांक (अंकों में)
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
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18		
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25		
26		
27		

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Answer of Q.1

Choose the correct option.

Ans (A) (c) Salt

Ans (B) (a) 1.26×10^{13}

Ans (C) (a) Butter.

Ans (D) (a) Al

Ans (E) (b) 2

Answer of Q.2

Fill ups

Ans (a) Vit. C (Ascorbic acid)

Ans (b) Liquid.

Ans (C) Synthetic.

Ans (d) Peptization.

Ans (e) +5.

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Answer of Q.3.

Match the pair:

'A'		'B'
(A) Schottky defect	→	(ii) NaCl
(B) Frankel defect	→	(v) AgCl
(C) Paramagnetism	→	(iii) O_2
(D) Zinc blende	→	(i) ZnS
(E) Cuprite	→	(iv) Cu_2O

Answer of Q.4.

True / false

Ans (a) false.

Ans (b) True.

Ans (c) True

Ans (d) True.

Ans (e) false

Answer of Q.5 (OR)

Molarity (M)

→ It is defined as the number of moles of solute (n_B) in one litre volume of solution (V_S)

Expression: $M = \frac{\text{no. of moles of solute } (n_B)}{\text{volume of soln } (lt)}$

⇒ $M = \frac{n_B}{V_S}$

⇒ $M = \frac{w_B}{M_B \times V_S}$ ∵ $\left[n_B = \frac{w_B}{M_B}\right]$

where w_B → weight of solute

M_B → Molar mass of solute

⇒ unit of M : mol. lt^{-1}

E
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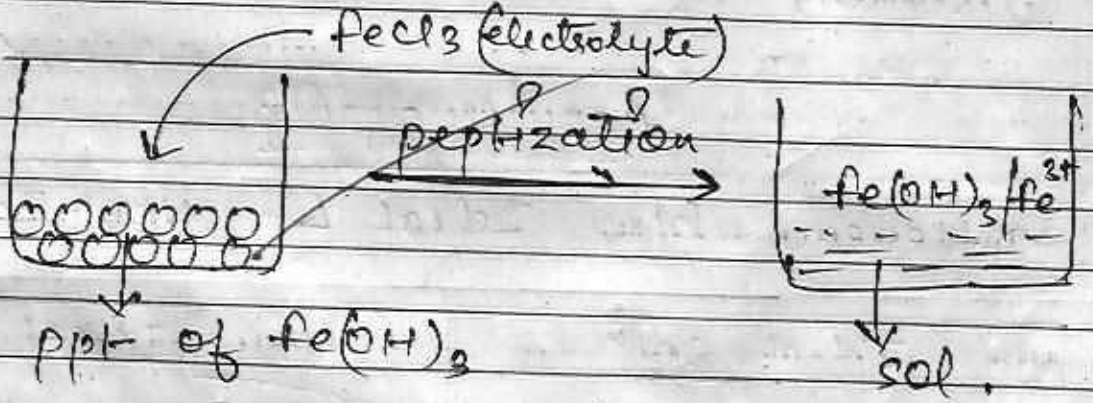
Answer of Q.6 (or)

Peptization

→ "The process of converting freshly prepared precipitate into colloidal solution with the addition of an electrolyte."

→ That electrolyte is known as peptizing agent.



Reaction $Fe(OH)_3 + \overset{+3}{Fe}Cl_3 \longrightarrow Fe(OH)_3/Fe^{3+}$ +ve sol.

Answer of Q.7 (or)

Ionization Isomerism

→ Those isomers which have same molecular formula and same element. But on Ionization, ions formed

are different due to the exchange of a ligand from co-ordination sphere to ionisation sphere

e.g (1) $[Co(NH_3)_5 Br] SO_4 \rightleftharpoons [Co(NH_3)_5 Br]^{+2} + SO_4^{2-}$

(2) $[Co(NH_3)_5 SO_4] Br \rightleftharpoons [Co(NH_3)_5 SO_4]^{+} + Br^{-}$

∴ Therefore (1) & (2) are ionisation isomers of each other.

Answer of Q.8.

Difference b/w Ideal & Non-Ideal sol^{n}:

S.N	Ideal sol^{n}	Non-Ideal sol^{n}.
1.	They obey Roult's law.	They do not obey Roult's law and show deviation.
	$P_{observed}$ = $P_{calculated}$	$P_{obs} \neq P_{calculated}$
	$P_A = P_A^\circ X_A$	$P_A \neq P_A^\circ X_A$
	$P_B = P_B^\circ X_B$	$P_B \neq P_B^\circ X_B$
	$P_T = P_A^\circ X_A + P_B^\circ X_B$	$P_T \neq P_A^\circ X_A + P_B^\circ X_B$.

2.	Interaction b/w all particles are equal A-A = B-B = A-B	Interaction b/w all particles are different A-A ≠ B-B ≠ A-B
3	$\Delta V_{mix} = 0$ &	$\Delta V_{mix} \neq 0$ &
	$\Delta H_{mix} = 0$.	$\Delta H_{mix} \neq 0$.

Answer of Q.9.

Ans (a) Carbylamine Reaction

This reaction is given by primary aliphatic and primary aromatic amine. When 1° amine reacts with strong base KOH and chloroform $CHCl_3$, a colourless gas with foul smell formed. i.e, isocyanide. Thus, this R^n is also known as Isocyanide Test.

$$\underset{\text{1° amine (aromatic/aliphatic)}}{R-\ddot{N}H_2} + \underset{\text{(chloroform)}}{CHCl_3} + 3KOH \longrightarrow \underset{\text{Isocyanide (foul smell)}}{R-\overset{\oplus}{N}\equiv\overset{\ominus}{C}} + 3KCl + 3H_2O$$

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Ans (b) Moffman Bromide Reaction

→ This reaction performed by Acid amide in the presence of Br_2 / KOH (or) KOBr and the formation of primary amine with one carbon less take place.

$$R-\overset{O}{\overset{\|}{C}}-NH_2 \xrightarrow[(or)\ KOBr]{Br_2/KOH} R-NH_2$$

n carbon — 1° amine. — (n-1) carbon.

Answer of Q.10.

Difference b/w D.N.A & R.N.A.

S.N	D.N.A (Deoxy ribo nucleic acid)	R.N.A (Ribo nucleic acid.)
1.	It is double stranded structure. These two strands forms a helix.	It is single stranded structure.
2.		

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2.	There are 4 Nitro-genous bases. Adenine, Guanine & Cytosin, Thymine	There are also 4 N$_2$ base but Thymine is replaced by Uracil.
3.	It is stable & least reactive due to H-bond b/w A=T. and G≡C. and Thymine i.e 5-methyl Uracil respectively.	It is comparitively less stable and more reactive.

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Answer of Q.11. (or)

First order Reaction

Those reaction whose order is unity are Ist order RN. $t=0 \rightarrow A_0$ (conc)

RN: $A \longrightarrow P$ $t=t \rightarrow A_t$ (conc).

→ Rate law expression for Ist order RN:

$$R = k[A]^1$$

$$-\frac{d[A]}{dt} = k[A]^1$$

$$\therefore R = -\frac{d[A]}{dt}$$

$$\therefore R = \frac{d[A]}{dt}$$

$$-\frac{d[A]}{[A]} = k(dt)$$

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Taking Integration on both sides.,

$$\Rightarrow -\int_{A_0}^{A_t} \frac{d[A]}{[A]} = \int_0^t k\,dt$$

$$\therefore \left[\int \frac{1}{x}\,dx = \ln x\right]$$

$$\Rightarrow -\left[\ln [A]_{A_0}^{A_t}\right] = k(t)_0^t$$

$$\Rightarrow -\left[\ln [A_t - A_0]\right] = kt$$

$$\Rightarrow \ln A_0 - \ln A_t = kt$$

$$\left[\ln m - \ln n = \ln\left(\frac{m}{n}\right)\right]$$

$$\Rightarrow \ln\left(\frac{A_0}{A_t}\right) = kt \qquad \therefore \left[\ln = 2.303 \log\right.$$

$$\Rightarrow \boxed{k = \frac{2.303}{t} \log\left(\frac{A_0}{A_t}\right)}$$

↓

Rate constant

Hence proved

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Answer of Q. 12. (OR)

Difference b/w Lanthanides and Actinides are —

S.N	Lanthanides	Actinides.
1.	They belong to 4f series.	They belong to 5f series.
2.	They are from 58 – 71	They are from 90 – 102.
3.	They are less basic.	They are more basic.
4.	They commonly exist in +3 O.S but some element show +2 & +4. O.S	They commonly exist in +3 O.S but can show +4, +5, +6, +7 O.S also.
5.	They have less tendency to form oxocation.	They have more tendency to form oxocation.
6.	They posses lanthanoid contraction (smaller than A.C)	They possess Actinoid contraction. (greater than L.C)

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Answer of Q.13

Ans (i) freons

→ freons are methyl or ethyl compound of chlorine and flourine.

→ They acts as a refrigent.

→ They deplete the ozone layer in our atmosphere.

~~$SbCl_4 + PtF_6 \xrightarrow{SbCl_3}$~~ $CCl_4 \rightarrow CCl_2F_2$ (chloro flouro carbon)

freon 12

Reaction :

→ $CCl_4 + SbF_6 \xrightarrow{SbCl_3} CCl_2F_2$

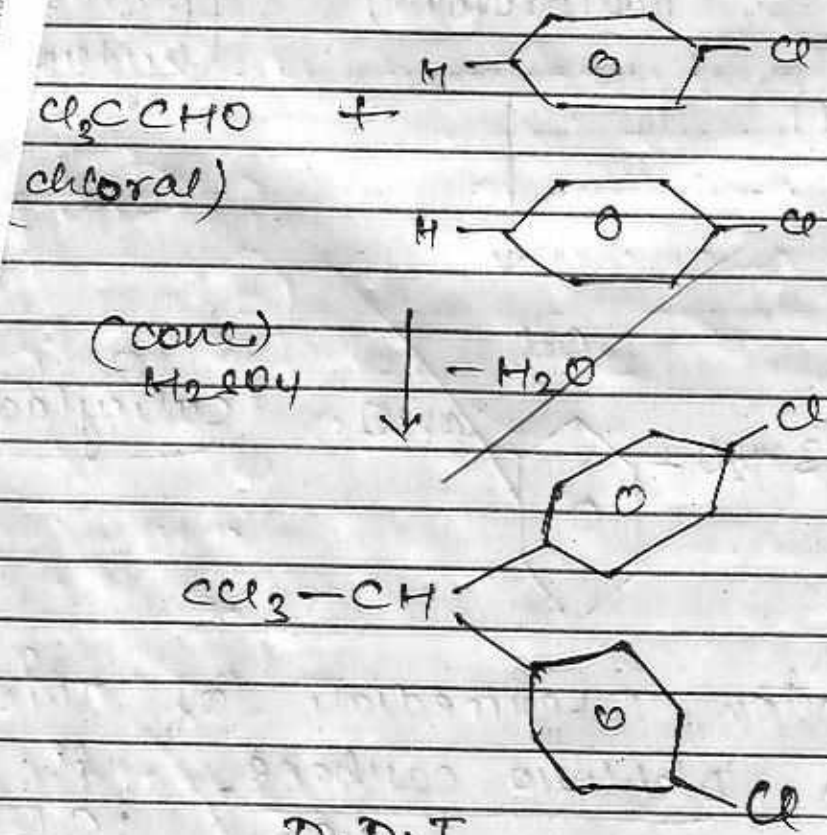
(chloro flouro carbon)

freon 12

Ans (ii) D.D.T (Dichloro Diphenyl Trichloro-ethane)

→ D.D.T is an insecticide. It is less toxic to Human as compared to insect.

→ D.D.T is form by mixing chloral (CCl_3CHO) with dichloro benzene in the presence of H_2SO_4 conc.



D.D.T

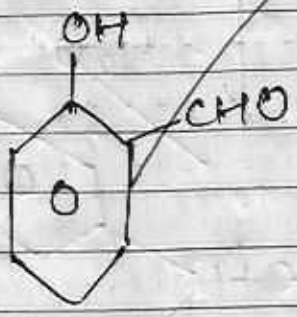
Answer of Q.14

Ans (a) Riemer Tiemann Reaction

When phenol reacts with chloroform ($CHCl_3$) in the presence of strong base (KOH). Then, the compound salicyldehyde will be formed.

(phenol)

+ $CHCl_3$ (chloroform) + 3KOH (pottasium hydroxide)



$3KCl + 3H_2O +$

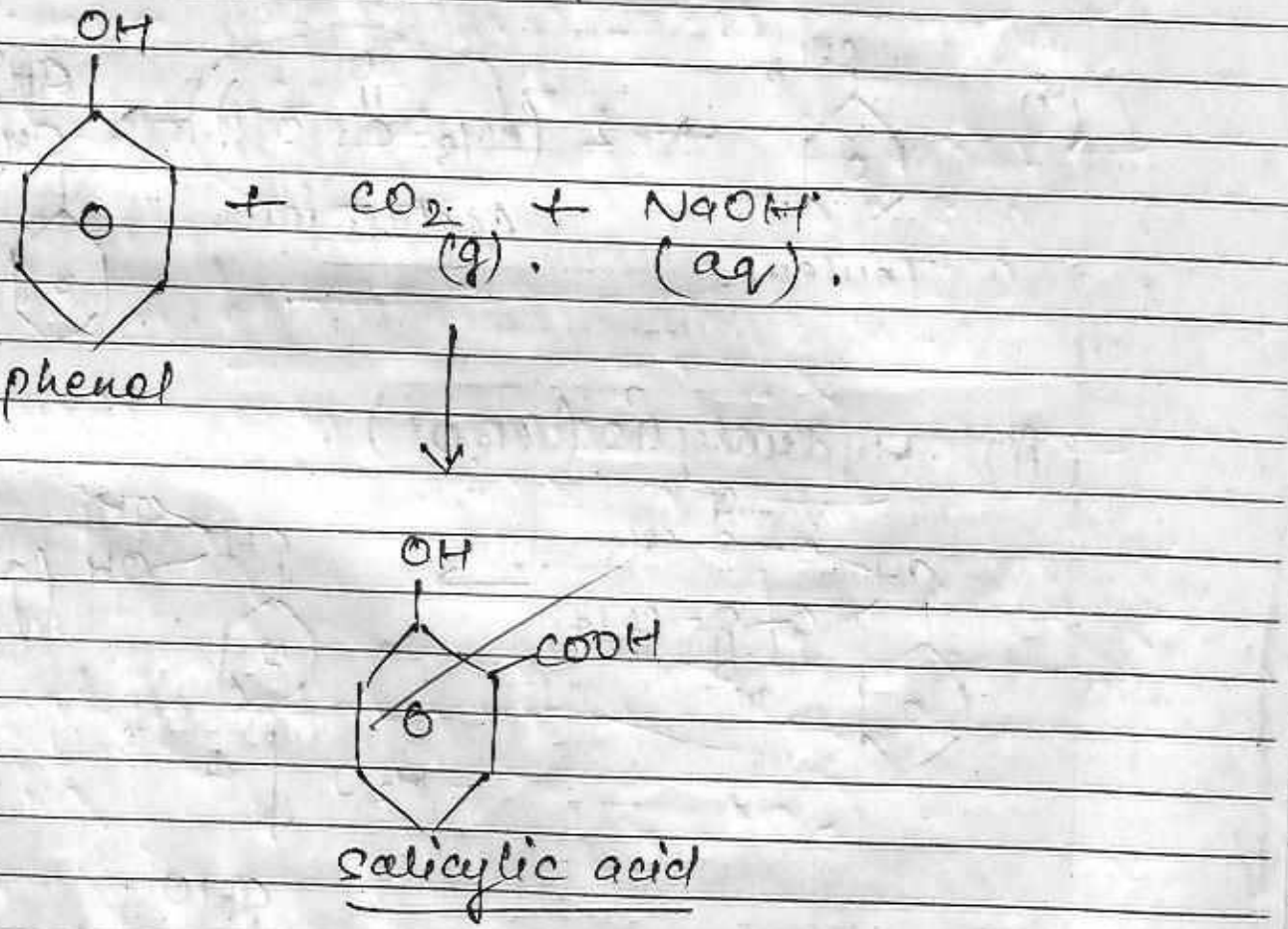
salicyladehyde.

Reaction Intermediate of this Rn is Dichloro carbene.

i.e, $:\ddot{C}Cl_2$

Ans (b) Kolbe Reaction

In this Reaction, Salicylic acid will be formed by the reaction of phenol with CO_2 (carbon-di-oxide) and NaOH strong base.



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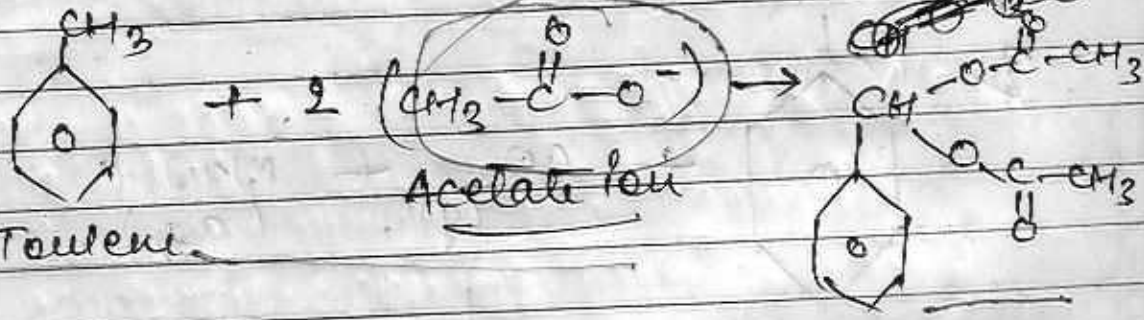
Answer of Q.18

Ans(1) Etard's Reaction

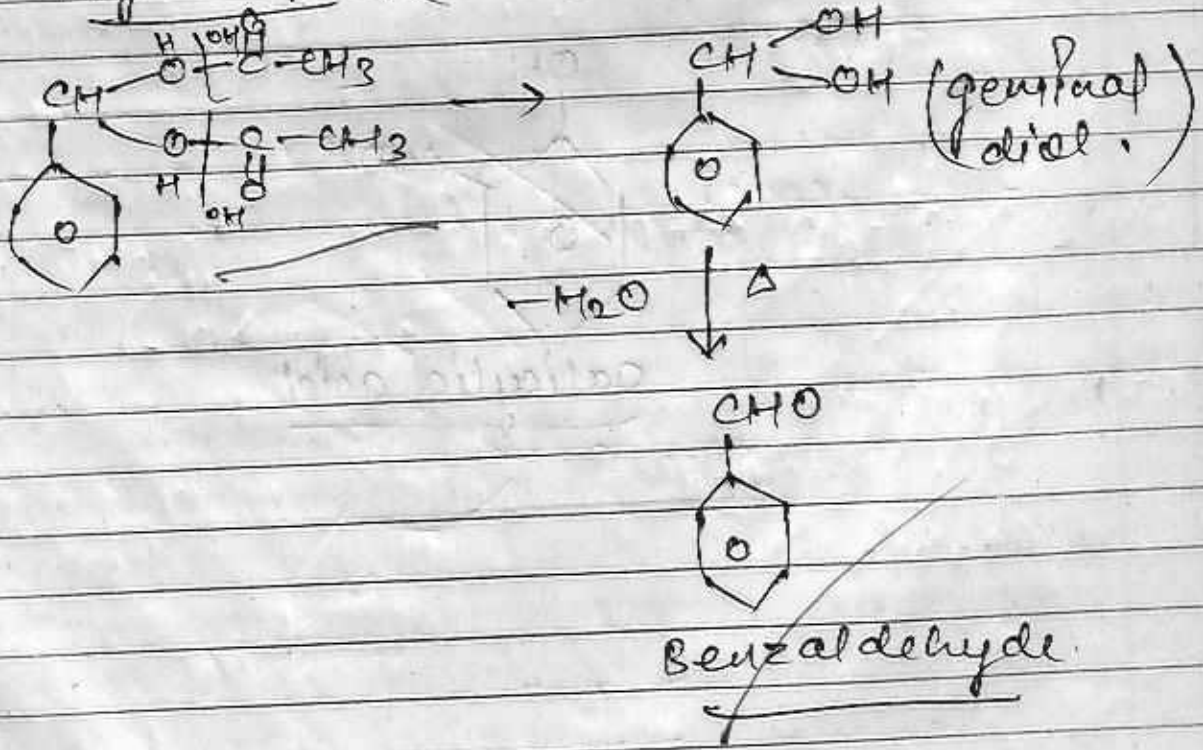
It can be performed by two ways:

(I) Etard oxidation $\left(CH_3-\overset{\overset{O}{\|}}{C}-O-\overset{\overset{O}{\|}}{C}-CH_3\right)$

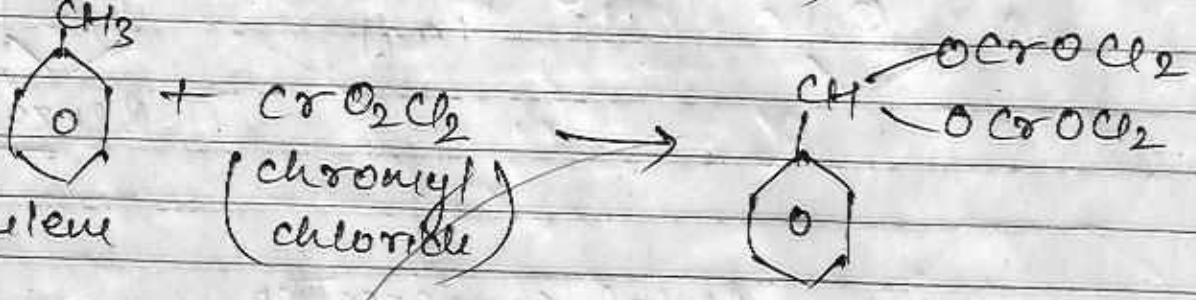
(i)



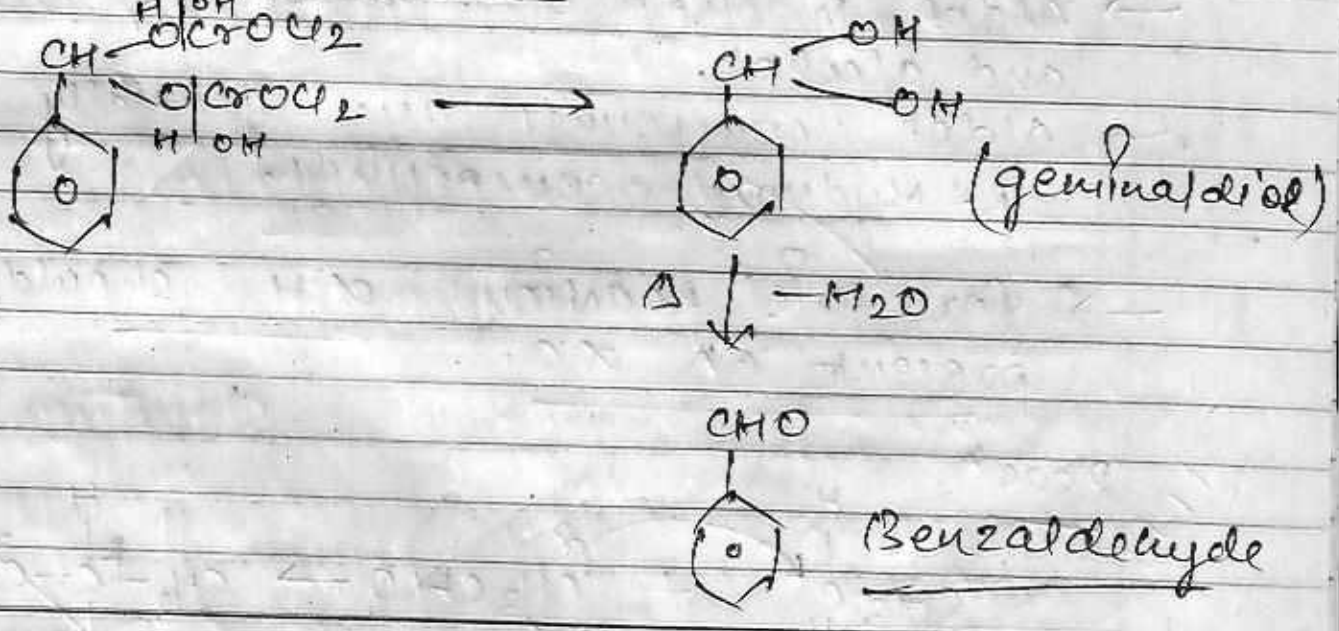
(ii) Hydrolysis (H_3O^+)



(II) Etard's oxidation (CrO_2Cl_2)

(i) 

(ii) Hydrolysis (H_3O^+)



Ans (b) Gattermann koch Reaction

This reaction includes the mixing of benzene, CO (carbon monoxide) and HCl. Thus product will be benzaldehyde.

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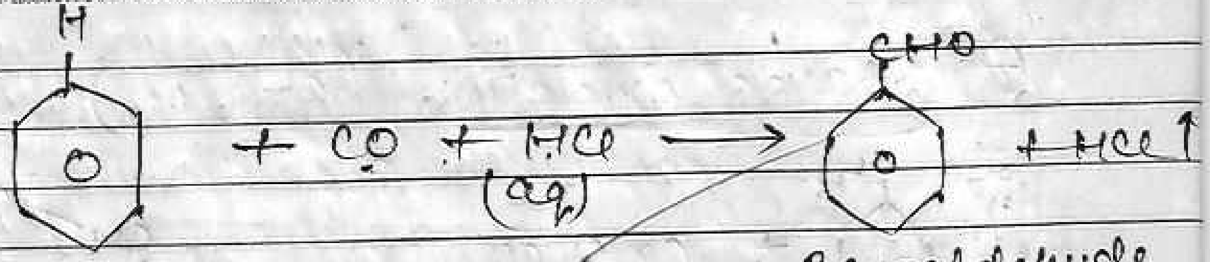


Benzaldehyde

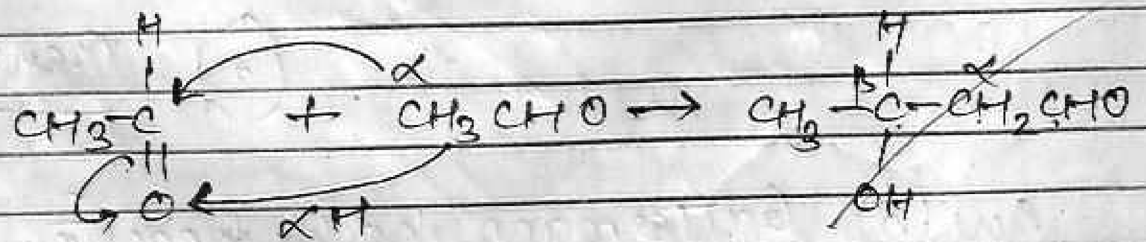
Ans (iii) Aldol condensation

→ Aldol is the combination of Aldehyde and alcohol.

→ Aldol compounds are generally β-Hydroxy compounds.

→ for this reaction αH should be present on αC.

Reac^n



β-Hydroxy ~~aldol~~. butanal

(Aldol)

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Answer of Q16

Kolhrasch law

According to this law, molar conductivity of each and every constituent in a reaction at infinite dilution make its own contribution in molar conductivity of solution.

Λ_m^∞ = molar conductivity at ∞ dilution

$$\Lambda_m^\infty = \lambda_c^\infty \times n_c + \lambda_a^\infty \times n_a$$

n_c = no. of cation
n_a = no. of anion.
λ_c^∞ = molar conductivity of cation at ∞ Dil
λ_a^∞ = molar conductivity of anion at ∞ Dil.

Application of Kolhrasch law

(1) By this law we can determine molar conductivity of weak acid.

$$CH_3COOH + NaCl \longrightarrow CH_3COO^- Na^+ + HCl$$

$$\Lambda_{m(CH_3COOH)}^\infty = \lambda_{m(CH_3COONa)}^\infty + \lambda_{m(HCl)}^\infty - \lambda_{m(NaCl)}^\infty$$

(2) By Kohlrausch law, we can find degree of dissociation (α) of weak acid at any conc.

$$\alpha = \frac{\lambda_m^c}{\lambda_m^\infty}$$

$c \longrightarrow$ (at any conc.) Molar conductivity

$\lambda_m^\infty \longrightarrow$ (at $C \to 0$, $D.l = \infty$) Molar conductivity.

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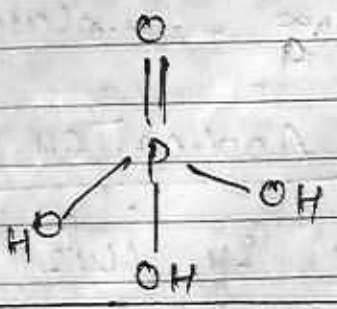
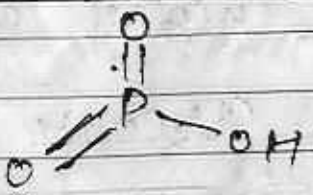
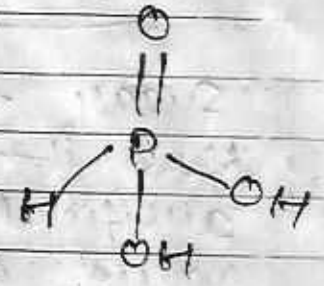
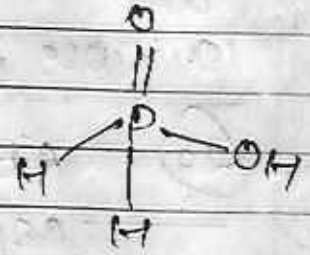
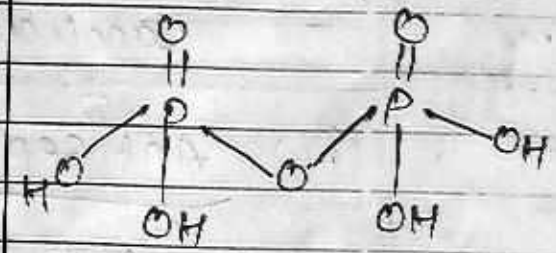
Answer of Q.17 (or)

Oxyacids of phosphorus.

	Name	formula	Structure
1.	phosphoric acid	H_3PO_4	
2.	Meta phosphoric acid	HPO_3	

3.	phosphorous acid	$\overset{+3}{H_3PO_3}$	
4.	Hypophosphorous acid	$\overset{+1}{H_3PO_2}$	
5	ophosphonic acid	$\overset{+5}{H_4P_2O_7}$	

Answer of Q.18

(i) Antibiotics : Antibiotics are the substance which are obtained from microbes and are used to destroy them or prevent them.

eg. Penicillin & chloramphenicol, ...
(Ist v antibiotic discovered)

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(ii) Artificial sweetner

Sugar has high calorific value and thus it is unhealthy. Now-a-days artificial sweetners of low calorific value are produced. These sweetners are much more times sweeter than sucrose.

eg Alitame → 2000 times sweeter
Aspartame → 100 times sweeter
Sucralose → 600 times sweeter
Saccharin → 550 times sweeter.

(iii) Antiseptic

These are the ~~sweet~~ chemicals which can be applied on wound to prevent bacterial infection. These do not harm the living tissue.

eg (1) Dettol (chloroxylenol + terpineol)
(2) 0.2% phenol acts antiseptic.

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Ans (iv) Anti Inflammatory — Anti-Histaminic drugs

These are the chemicals which prevent the effect of Histamine during allergy and stop inflammation.

eg (1) Ranitidine and (2) Avil.

Ans (v) Antacid

These are the chemicals which reduce excess acid in our stomach i.e., acidity. They help in digestion of food.

eg. Digi...