



# माध्यमिक शिक्षा मण्डल, मध्यप्रदेश, भोपाल

वर्ष 2019<sup>24</sup> 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

माध्यमिक शिक्षा मण्डल, भोपाल

परीक्षा का क्रमांक 319- 0296876

परीक्षार्थी का रोल नम्बर

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एक एक दो चार तीन नौ पांच 90 गति

क :- पूरक उत्तर पुस्तिकाओं की संख्या अंकों में 01 शब्दों में one

ख :- परीक्षार्थी का कक्ष क्रमांक 07

ग :- परीक्षा का दिनांक 28/03/2019

परीक्षा का नाम एवं परीक्षा केन्द्र क्रमांक को मुद्रा

~~हायर सेकेंडरी परीक्षा~~ केन्द्र क्रमांक 182001

पर्यवेक्षक का नाम एवं हस्ताक्षर

केन्द्राध्यक्ष/सहायक केन्द्राध्यक्ष के हस्ताक्षर

28/03/19

परीक्षक एवं उपमुख्य परीक्षक द्वारा भरा जावे ↓

प्रमाणित किया जाता है कि मूल्यांकन के समय पूरक उत्तर पुस्तिकाओं की संख्या उपरोक्तानुसार सही पाई हो। क्राफ्ट स्टीकर क्षतिग्रस्त नहीं पाया गया तथा अन्दर के पृष्ठों पर अंकों की प्रविष्टि एवं अंकों का योग सही है।

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

उपमुख्य परीक्षक के हस्ताक्षर एवं निर्धारित मुद्रा

परि. एवं निर्धारित मुद्रा

AZEEZUR-REHMAN  
VARISTHA ADHYAK  
MOB. No. 93337 73  
VALUER No. 96761 3  
GOVT. H. S. SCHOOL  
BHATKHEDE NEPANAGAR

Ch... are  
Ver...  
Mob...  
V.No. 571.../17/05N  
Govt. H. S. S. Daryapur

केवल परीक्षक द्वारा भरा जावे।

प्रश्न क्रमांक के सम्मुख प्राप्तांकों की प्रविष्टि करें।

प्रश्न क्रमांक	पृष्ठ क्रमांक	प्राप्त अंकों में
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कुल प्राप्तांक शब्दों में : कुल प्राप्तांक अंकों में

Laser/Inkjet Copier Labels A 457-16 99.1 X 138 mm X 16

de/mol

परीक्षार्थी द्वारा भरा जावे

केन्द्राध्यक्ष/सहायक केन्द्राध्यक्ष एवं पर्यवेक्षक द्वारा भरा जावे

परीक्षक एवं उपमुख्य परीक्षक द्वारा भरा जावे

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Answer no. - 01

(i) → (a) 8 ✓

(ii) → (b) adsorbate ✓

(iii) → (d) Roasting ✓

(iv) → (a) 1° amine ✓

(v) → (b) Lactose ✓

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Answer no. - 02

(i) Free electrons ✓

(ii) Copper ✓

(iii) P<sub>4</sub> ✓

(iv) Three ✓

(v) Acetaldo nitrite ✓

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Answer no. - 03

(i) Schottky defect - NaCl

(ii) Gold number - Lyophilic colloid

(iii) Bleaching powder -  $\text{CaOCl}_2$

(iv) Natural rubber - Isoprene

(v) Bakelite - Thermosetting plastic

Answer no. - 04

(i) 0.225 ✓

(ii)  $K = A e^{-E_a/RT}$  ✓

(iii) Mond process ✓

(iv) Helium (He) ✓

(v) Due to d-d transition, transition metals are coloured ✓



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$$\square + \square = \square$$

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Answer no. - 05 (i)

Given :-

Partial pressure (P) = 0.987 bar

Henry's constant  $K_H = 76.48$  bar

Find :- millimoles (m)

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We know that,

$$P = K_H \cdot m$$

$$m = \frac{P}{K_H}$$

$$m = \frac{0.987}{76.48}$$

$$m = 1.02 \times 10^{-3} \text{ moles}$$

$$m = 1.02 \text{ moles}$$

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Answer no. - 06 (ii)

(i) Beam of light passes through a colloidal sol?

Ans - When a light beam is passed through a sol, its path becomes visible due to scattering of light with colloidal particles. This effect is called as Tyndall effect.

(ii) Electric current is passed through sol?

Ans - When electric current is passed through a sol then colloidal particles will move toward electrodes under the electric field, this process is called as Electrophoresis.

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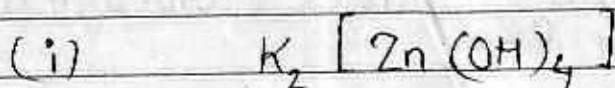
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Answer no. - 07 (ii)

IUPAC Name



→ Potassium tetrahydroxo zincate (II)



→ Diamine argentum (I) dicyano argentite (II)

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Answer no. - 08 (i)

i Definitions

(i) Mole fraction : Mole fraction of the component is the ratio of no. of moles of that component to that of total no. of moles of all the components in the solution, is called as Mole fraction.

It is denoted as  $X$ .

for solvent,

$$X_a = \frac{n_a}{n_a + n_b}$$



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for solute,

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

$$\therefore X_A + X_B = 1$$

(ii) Molality: Number of moles of solute dissolved per 1000 gram of solvent, is called molality. It is denoted as 'm'.

$$\text{Molality (m)} = \frac{W_B}{M_B} \times \frac{1000}{W_A (\text{in g})}$$

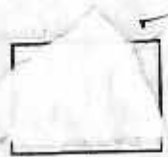
On increasing temperature, molality remain unaffected.

(iii) Molarity: Number of moles of solute dissolved per litre of solution is called as Molarity. It is denoted as 'M'.

$$\text{Molarity (M)} = \frac{W_B}{M_B} \times \frac{1000}{V (\text{in ml})}$$

On increasing temperature, molarity decreases.

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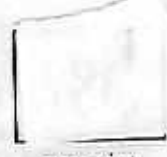
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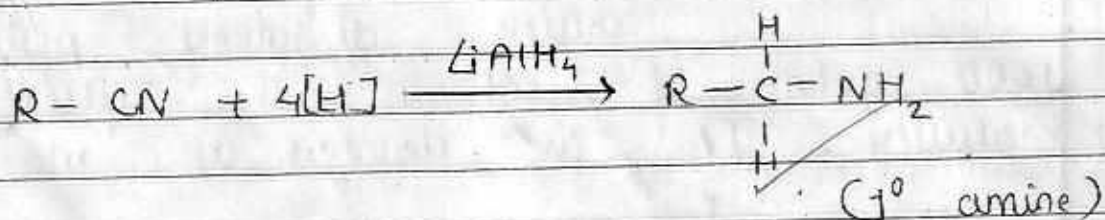


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Answer no. - 29 (i)

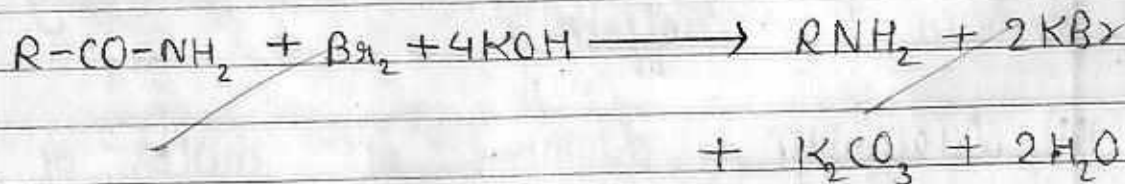
Reactions

(i)  $\rightarrow$   $1^\circ$  amine forms



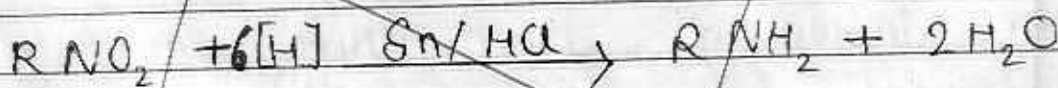
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(ii)  $\rightarrow$   $1^\circ$  amine forms



This reaction is called Hoffman bromo amide reaction

~~(iii)  $\rightarrow$   $1^\circ$  amine forms~~

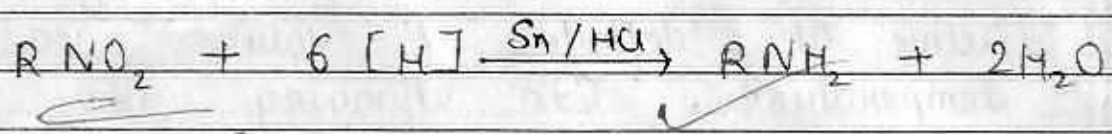




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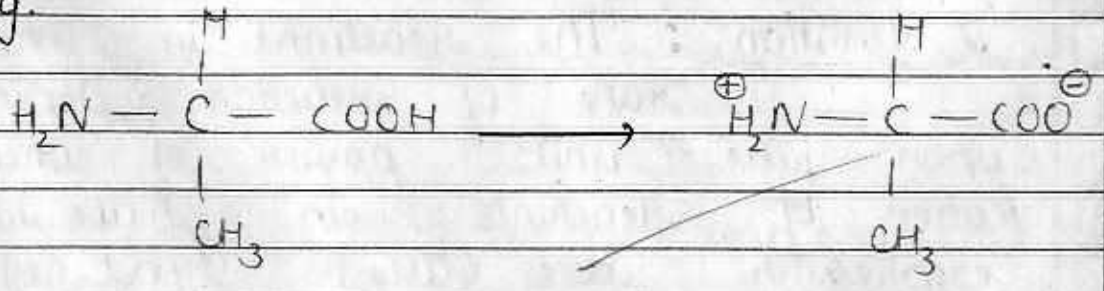
(iii) Amine forms



Answer no. - 10 (i)

Zwitter ion : In amino acids,  $H^+$  ion hydrogen of carboxylic acid shift on the amine group, due to which anion and cation are produced on same compound, this is called Zwitter ion.

eg.



Zwitter ion.

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(ii) Protein denaturation : Proteins are biologically active at definite  $p^H$  value and temperature. On changing the temperature and  $p^H$  value, secondary, tertiary and quaternary structures of proteins get destroyed and it becomes biologically inactive. This called Denaturation of proteins.

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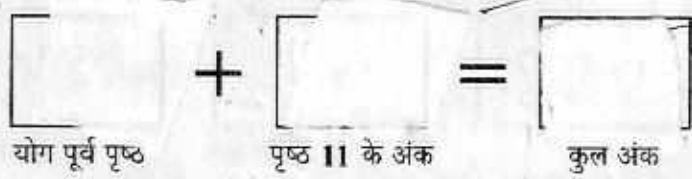
e.g. - On heating egg, albumin denature, Transformation of milk into curd.

Answer no. - 11 (ii)

Defination : The reactions in which rate of reaction depends upon the unit power of concentration of reactants in rate law expression are called First order reactions.

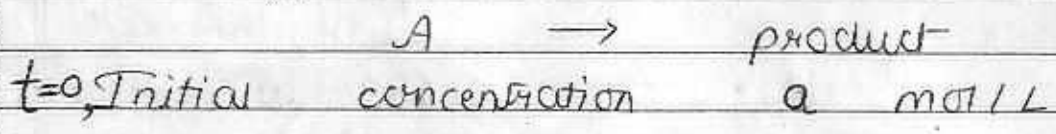
The time at which initial concentration of reactants becomes half is called as half life period.

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Proof :- Let a chemical reaction proceed as



at time  $t$ , rest amount of reactants  $(a-x)$

at  $t_{1/2}$ ,  $x = \frac{a}{2}$  and  $t = t_{1/2}$

from, Rate constant for first order reactions.

$$\log K = \frac{2.303}{t} \log \frac{a-x}{a}$$

$$\Rightarrow \log K = \frac{2.303}{t_{1/2}} \log \frac{a - \frac{a}{2}}{a}$$

$$\Rightarrow \log K = \frac{2.303}{t_{1/2}} \log \frac{a}{2} \times \frac{1}{a}$$

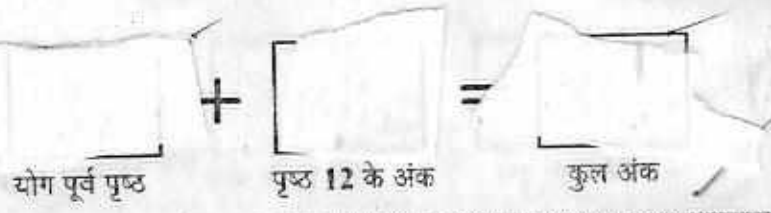
$$\Rightarrow \log K = \frac{2.303}{t_{1/2}} (\log 2 - \log 1)$$

$$\Rightarrow \log K = \frac{2.303}{t_{1/2}} \times 0.3010 \quad \left\{ \begin{array}{l} \because \log 1 = 0 \\ \log 2 = 0.3010 \end{array} \right.$$

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(12)



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$$\Rightarrow \log K = \frac{0.693}{t_{1/2}}$$

$$t_{1/2} = \frac{0.693}{\log K}$$

It clears that, Half life period of first order reaction is independent to initial concentration of reactants (a).

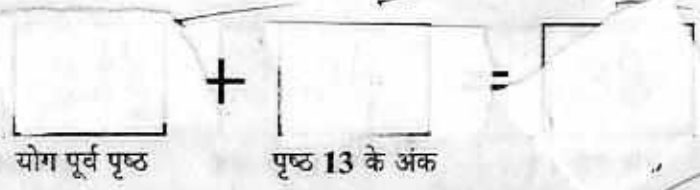
B  
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Answer no. - 12 (ii)

1<sup>st</sup> transition series -

Sc, Ti, V, Cr, Mn, Fe, Co, Ni, Cu, Zn

(ii) Atomic radii :- In transition metals, last electrons enters in partially made d-subshell. Since, due to increasing nuclear charge, atomic radii decreases on moving left to right. from Sc to Zn. But due to increasing screening effect, at 1<sup>st</sup> size increases.



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(ii) Ionization energy : On moving left to right in 1<sup>st</sup> transition series, atomic radii decreases as the result ionization energy increases.

(iii) Metallic character : Since, last electrons enters in partially filled d-subshell. Outer most s electrons form metallic bonding. Due to half filled d orbitals, auxiliary covalent bonds are formed which will make metallic bonding stronger. So, these are hard and brittle metals. On moving left to right in 1<sup>st</sup> transition series, due to full filled d-orbitals, metallic character decreases.

(iv) Oxidation state : Middle elements of transition metals shows higher oxidation state. (+2) oxidation state is general oxidation for transition metals of 1<sup>st</sup> transition series.

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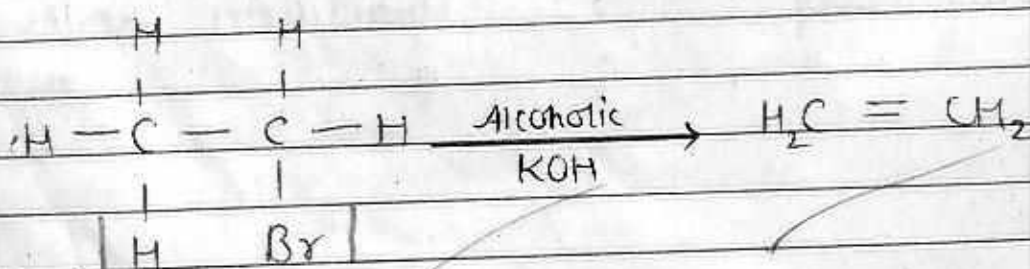
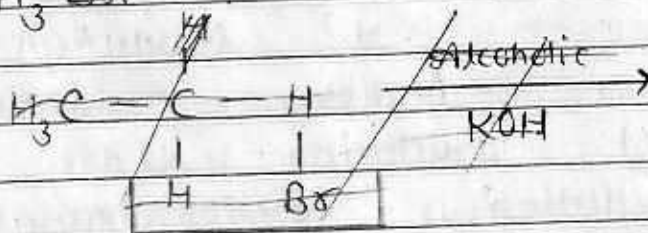
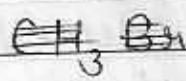
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Answer no. - 13 (ii)

Elimination reaction

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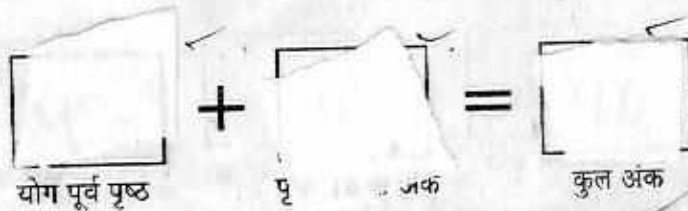
When alkyl halide reacts with alcoholic KOH then hydrogen halogen group gets eliminated and alkenes forms. This reaction is called Elimination reaction or  $\alpha$ ,  $\beta$  elimination or Dehydrohalogenation.







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Answer no. 14 (c)

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Points	Alcohol	Phenol
(1) Physical state	Liquid	Solid
(2) Odour	Alcoholic	Phenolic
(3) Acidic nature	Less than water	More than water
(4) Give man nitroso test	Do not give	Give it
(5) Reaction with bromine water	No reaction occur	2,4,6-Tribromo phenol obtains

17

$$\boxed{\phantom{00}} + \boxed{-} = \boxed{\phantom{00}}$$

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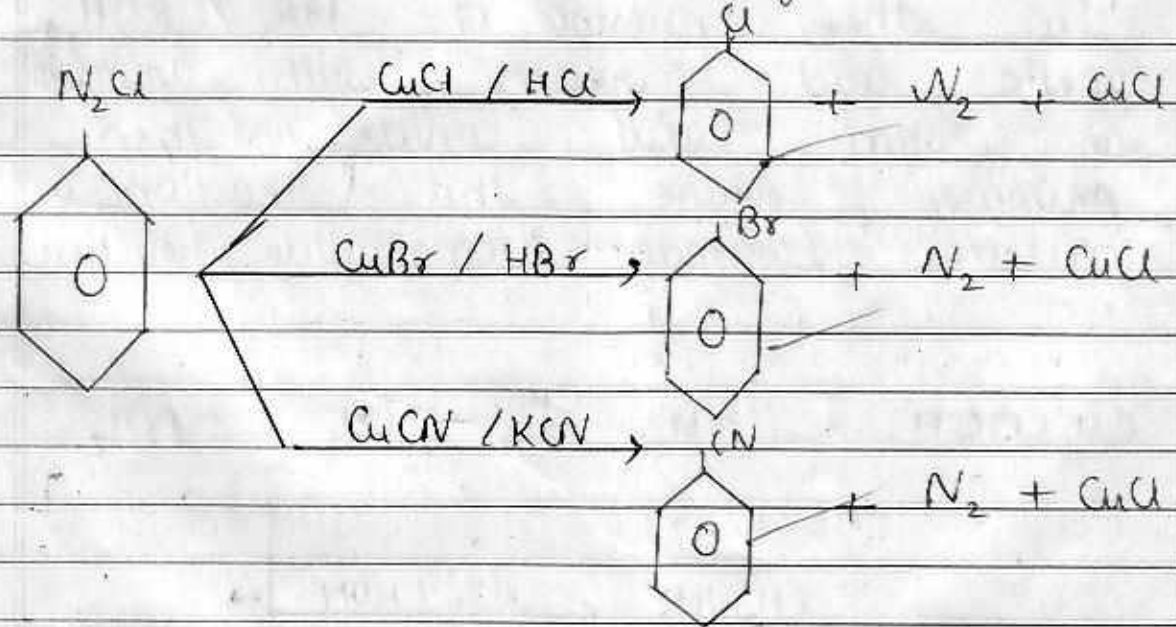


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Answer no. - 15 (ii)

(1) Sandmeyer reaction

When diazonium chloride reacts with cupric halide with corresponding halo acid then chloro benzene and bromo benzene forms. This reaction is called as Sandmeyer's reaction.



(2) Stephens reaction

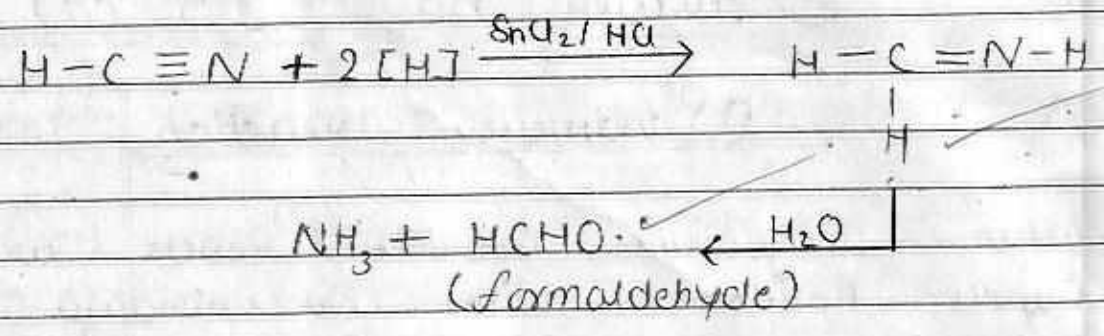
In presence of  $\text{SnCl}_2 / \text{HCl}$ , reduction of cyano compounds into aldehydes is called stephen reduction.



18



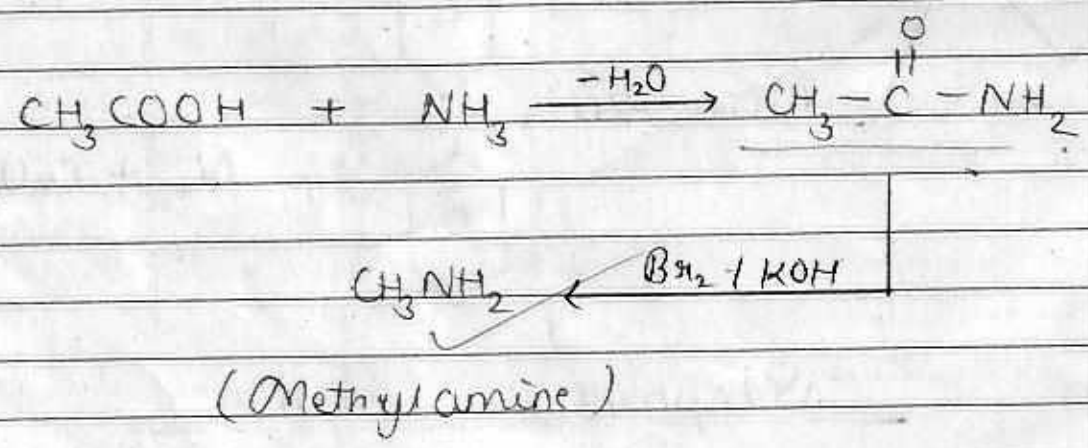
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(3) Hoffman Bromoamide reaction

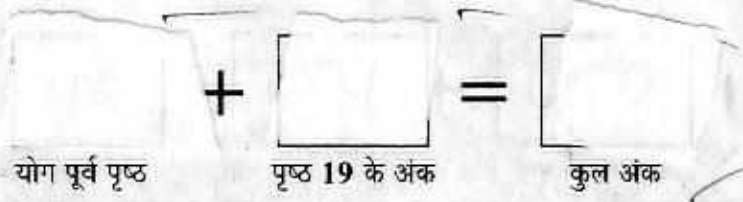
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In the presence of  $\text{Br}_2 / \text{KOH}$ , acetic acid reacts with ammonia to form acid amide and then primary amine, this reaction is called Hoffman bromoamide reaction.



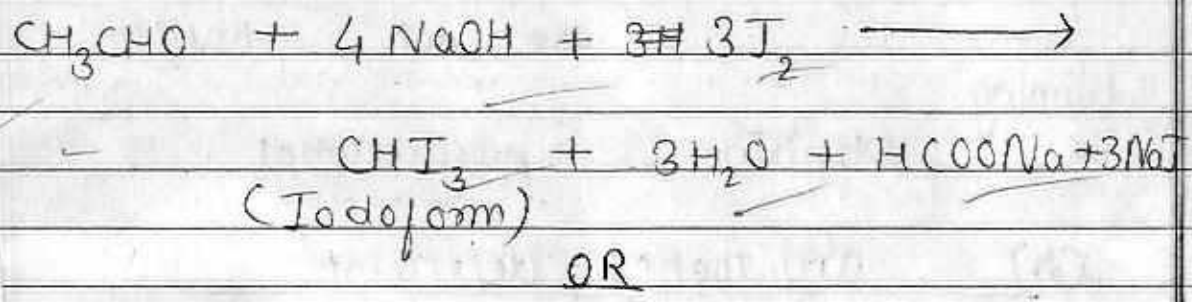
(4) Haloform reaction

Such organic compounds in which acetyl group ( $\text{COCH}_3$ ) is present.

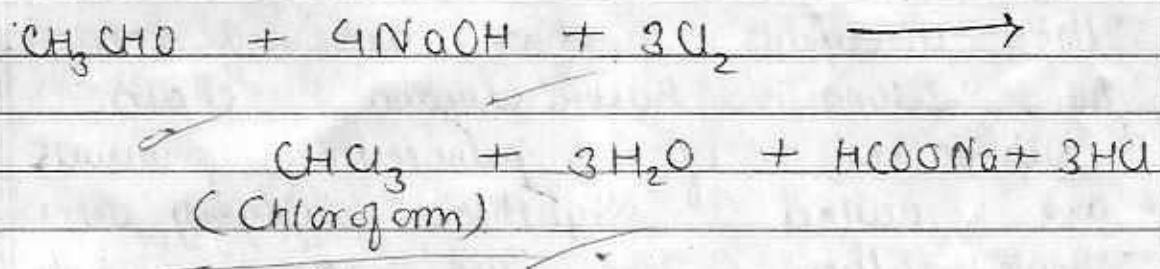


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OH may be formed reacts with halogens to form chloroform and iodoform. This is called haloform reaction.



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Answer no. - 18 (ii)

(a) Analgesics - The drugs which are used to provide relief from pain are called Analgesics. These directly attacks on central nervous system. These drugs also reduce fever.

e.g. Aspirin and paracetamol have both character.



प्रश्न क्र.

(i) ~~A~~ Narcotics - Such analgesics which are habit forming.  
e.g. Morphine, Codeine etc.

(ii) Non-narcotics - Such analgesics which are not habit forming.  
eg. Aspirin, paracetamol.

(b) Synthetic detergents

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The detergents which are formed by long hydro carbon chain sulphonates of petroleum products are called Synthetic detergent detergents. These are use to remove dust particles.

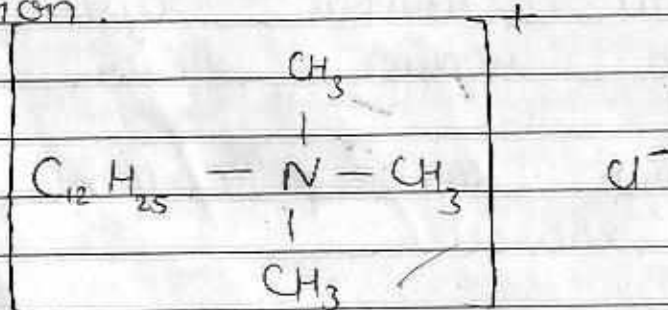
These are of following

types -

Cationic

(i) ~~Anionic~~ Cationic detergent - The detergents whose ani cation takes place in cleaning action.

e.g.





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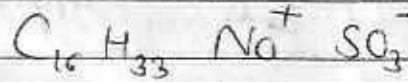
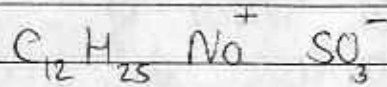


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These are costly detergents and are used in hair conditioning.

Anionic

(ii) ~~Anionic~~ Cationic detergent : The detergents whose  $+ve$  ion takes place in cleaning action.  
e.g.



(iii) Neutral detergent :- The detergents which do not have ions.

e.g. Soap used in utensils

(iv) Amphoteric detergent : The detergents whose  $+ve$  as well as  $-ve$  part takes place in action.

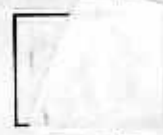
e.g. Shampoo

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Answer no. - 16 (ii)

(a) Cell constant -

Ratio of distance between any two electrodes to that of area of any one electrode is called as Cell constant. It is represented as  $X_c$ .

Mathematically,

$$X_c = \frac{l}{A}$$

Unit -  $m^{-1}$

Relation b/w  $R$  &  $X_c$  -

If specific conductivity is  $K$  (Kappa) we know that,

$$R = \frac{\rho l}{A}$$

$$R = \rho \cdot X_c$$

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$$\frac{1}{C} = \frac{1}{K} \times X_c$$

$$K = X_c \cdot C \quad \dots (1)$$

In eq (1)

- $K$  = Specific conductivity
- $X_c$  = Cell constant.
- $C$  = Conductivity

(b) Given :-

Resistance ( $R$ ) = 1500  $\Omega$   
 Conductance ( $G$ ) =  $0.146 \times 10^{-3} \text{ Sm}^{-1}$

$$\therefore \text{Conductance} = \frac{1}{\text{Specific resistance}}$$

$$\text{or } R = \frac{1}{G}$$

$$\text{the } G = \frac{1}{0.146 \times 10^{-3} \text{ Sm}^{-1}}$$

$$G = \frac{10^3}{0.146} \text{ Sm}$$

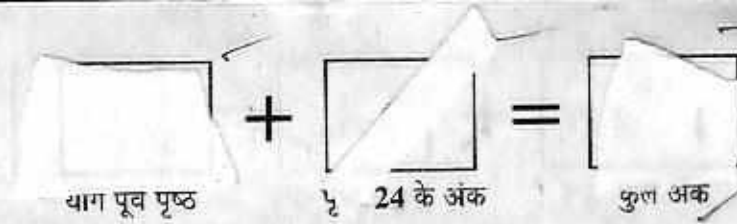
We know that,

$$R = \rho \cdot X_c$$

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प्रश्न क्र.

$$X_c = \frac{R}{P}$$

$$X_c = \frac{1500 \times 0.146}{10^{-3}}$$

$$X_c = 219.000 \times 10^3 \text{ m}^{-3}$$

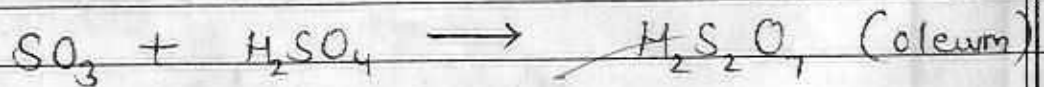
Answer  $X_c = 219 \times 10^3 \text{ m}^{-3}$

B  
S  
E

Answer no. - 17

Contact process

(i) Principle :-



(Sulphuric acid)



परीक्षार्थी द्वारा भरा जावे ↓

परीक्षा का विषय

विषय कोड

परीक्षा का माध्यम

परीक्षा का दिनांक

Chemistry 2 2 0 English

28 03 2019

स्टीकर तीसरे के निशान ↓ से मिलाकर लगाये

परीक्षा का नाम एवं परीक्षा केन्द्र क्रमांक की मुद्रा

पूरक उत्तर पुस्तिका

182001

पर्यवेक्षक का नाम एवं हस्ताक्षर

Handwritten signature and name

केन्द्र प्रमुख / सहायक केन्द्राध्यक्ष के हस्ताक्षर

परीक्षार्थी द्वारा भरा जावे →



मुख्य उत्तर पुस्तिका के अंतिम पृष्ठ क्रमांक ..... तक कुल प्राप्त

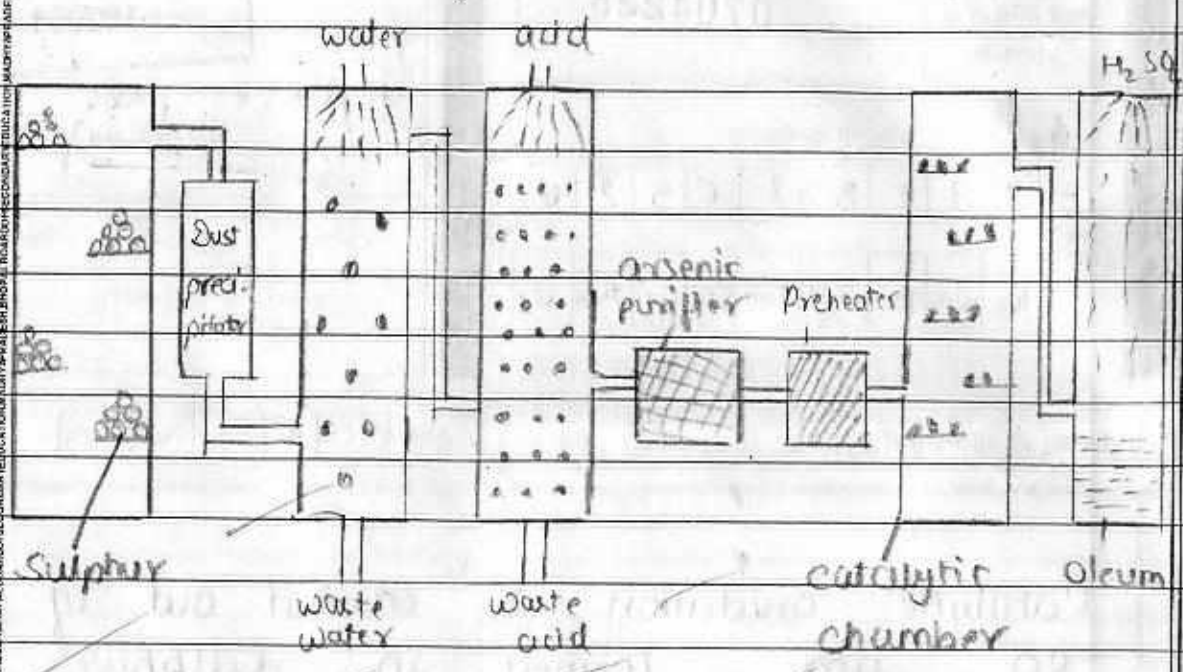
B  
S  
E

Catalytic oxidation is carried out of SO<sub>2</sub> gas formed in sulphur furnace. The formed SO<sub>2</sub> is passed through at the bottom reacts with H<sub>2</sub>SO<sub>4</sub> forming fuming H<sub>2</sub>SO<sub>4</sub> and Oleum (H<sub>2</sub>S<sub>2</sub>O<sub>7</sub>). On adding water in oleum, sulphuric acid of desired concentration may be obtained.

पृष्ठ के अंक का योग

प्रश्न क्र.

Labelled diagram :-



B  
S  
E

Main components -

- (i) Sulphur furnace - Formation of  $SO_2$  (sulphur dioxide) gas.
- (ii) Dust precipitator - Removal of dust particles from gaseous mixture.
- (iii) Cooling tower : Temperature should be control.





প্রশ্ন ক.

পুরক উত্তর পুস্তিকা  
182001

(iv) Drying tower : Removal of moisture from solution

(v) Arsenic purifier :  $As_2O_3$  as impurity is absorbed by  $Fe(OH)_3$

(vi) Preheater : Maintaining temperature for oxidation.

(vii) Catalytic chamber : Oxidation of  $SO_2$  is carried out.

(viii) Lat chamber : Formation of  $H_2SO_4$  from Oleum.

