



केवल मूल्यांकनकर्ता के उपयोग हेतु!

माध्यमिक शिक्षा मण्डल, मध्यप्रदेश, भोपाल

32 पृष्ठीय

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

प्रश्न क्रमांक	पृष्ठ क्रमांक	प्राप्तांक (अंकों में)	प्रश्न क्रमांक	पृष्ठ क्रमांक	प्राप्तांक (अंकों में)
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परीक्षक एवं उपमुख्य परीक्षक द्वारा भरा जावे ↓

→
परीक्षक एवं उपमुख्य परीक्षक द्वारा भरा जावे

प्रमाणित किया जाता है कि अन्दर के पृष्ठों के अनुरूप मुख्य पृष्ठ पर अंकों की प्रविष्टि एवं अंकों का योग सही है।
निर्धारित मुद्रा: नाम, पदनाम, मोबाईल नम्बर, परीक्षक क्रमांक एवं पदांकित संस्था के नाम की मुद्रा लगाएं।

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Question-1 : Write answer in one word/sentence.

Answer-1 : (i) Value of conductivity of superconductor is infinite.

(ii) chemical formula of potassium dichromate is : $K_2Cr_2O_7$.

(iii) central metal atom in $[Ni(CO)_4]$ is : Ni (Nickel).

(iv) Decreasing order of boiling points is :
 $RI > RBr > RCl > RF$.

(v) Hormone responsible for deep voice in males is : Testosterone.

Question-2 : Choose and write correct option.

Answer-2 : (i) (a) solution.

(ii) (c) 2

(iii) (c) Titanium

(iv) (c) C_6H_5CHO

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V) (a) $\text{H}_2\text{N}-\text{CH}_2-\text{CH}_2-\text{NH}_2$

i) (c) hormones.

Question-3 Fill in the blanks:-Answer-3 (i) Molarity.

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(ii) s^{-1} .

(iii) B

(iv) pungent pungent

(v) cyclic combined

(vi) protein.

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Question-4 :- Write True or False :-

Answer-4: (i) True.

(ii) False

(iii) True.

(iv) False.

(V) Time

(vi) Tense.

Question-5: Match the correct pair:

Answer-5: (i) Silicon $\xrightarrow{\text{doping}}$ (b) Semiconductor

(ii) $K_4[Fe(CN)_6] \longrightarrow Fe^{+2} + 6CN^{-}$ counter ions

(iii) Lucas Reagent $\rightarrow$ (d) Conc. HCl and ZnCl

(iv) Formic acid $\rightarrow$ (c) Red ants

(v) monosaccharides $\longrightarrow$ (a) Reducing sugars

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Question-6 (OR)Answer-6 (OR) $\Rightarrow$ Four chief sources of protein are:

- i) Egg ✓
- ii) Pulses ✓
- iii) Fish ✓
- iv) Meat ✓

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EQuestion-7 (OR)

Answer-7 (OR) $\rightarrow$ Faraday's first law of electrolysis says that the amount of substance discharged at electrode during the process of electrolysis is directly proportional to the quantity of electricity (charge) passed through the electrolytic solution.

$$\Rightarrow w \propto Q$$

$$w = ZQ$$

$$w = Zit$$

$$Z = E/F$$

$$\left[\begin{array}{l} Z = \text{electrochemical equivalent} \\ w = \text{weight of substance deposited} \\ Q = \text{amount of charge} \\ i = \text{current flow} \\ t = \text{time for which current flows} \end{array} \right]$$

$$Q = it$$

Question-8

Answer 8:- Elementary reactions:- Those type of reactions that are completed in a single step only are known as elementary reactions. The order and molecularity of such reactions can be directly determined by the sum of stoichiometric coefficients of its reactants.

Question-9

Answer-9:- Characteristics of interstitial compounds are given below:-

- (i) They are harder than the parent metal and the conductance of parent metal remains same in the interstitial compound. Formation of interstitial compound doesn't affect the conductance.
- (ii) After formation of these compounds, parent metal becomes chemically inert. Also, non-metals like B, C, N, H are placed in interstitial sites in a non-stoichiometric ratio.

Eg. Mn_4N .

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Question-10

Answer-10 Homoleptic complex: The type of coordination compounds in which all the ligands bonded to central metal ion/atom are identical.

~~only one kind of ligand~~

example: $[\text{Ni}(\text{CO})_4]$, $[\text{Fe}(\text{CO})_5]$ and $[\text{Ni}(\text{en})_3]^{+2}$

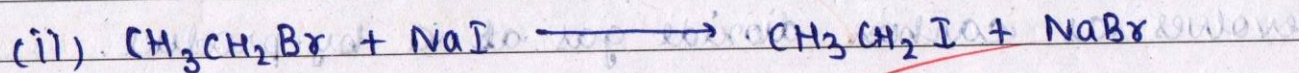
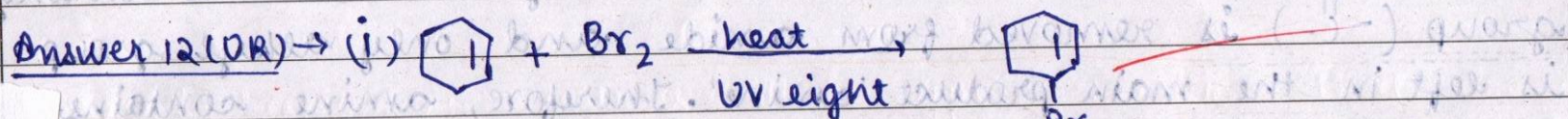
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FQuestion-11

Answer-11 → ~~Write~~ Formulas for the following coordination compound are:

(i) Potassium tetracyanonickelate(II) : $\text{K}_2[\text{Ni}(\text{CN})_4]$

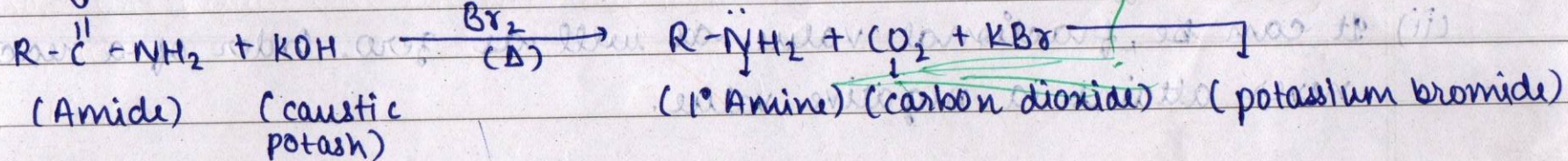
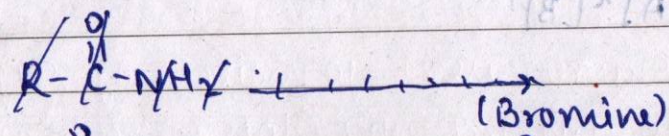
(ii) Pentaamminecarbonatocobalt(III) chloride : $[\text{Co}(\text{NH}_3)_5(\text{CO}_3)]\text{Cl}$

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Question-12 (OR)Question-12 Question-13 (OR)

Answer -13 (OR) $\Rightarrow$ Hoffman's bromamide degradation reaction - This is the reaction used for the preparation of primary amines and anilines from amides. In this reaction, amide is heated with caustic potash and bromine gas to produce amines of the respective amide.

• chemical equation for this reaction is -



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→ From the above equation, it can be clearly seen that the carbonyl group ($-C=O-$) is removed from amide and only alkyl group is left in the main product 'amine'. Therefore, amine contains one carbon less than that present in the amide. This carbonyl group evolves as carbon dioxide gas as a by-product.

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EQuestion-14 (OR)

Answer-14 (OR) ⇒ ORDER OF A REACTION: It is defined as the number of molecules participating in a reaction and whose concentration changes with time.

⇒ characteristics of the order of reaction are as follows.

(i) It is determined experimentally, not theoretically. But for ease, we have rate law expression: $R = k[A]^x[B]^y$
Order of reaction $= x + y$.

(ii) It can be fractional value as well as zero. Order of a reaction never attains a negative value.

(iii) Order of a reaction can be more than three also. For an elementary reaction, it's the sum of stoichiometric coefficients of its reactants while for a complex reaction, it's calculated through rate-determining step (rds) reaction.

Question-15 (OR)

Answer-15 (OR) - All the elements in the periodic table gain or lose electrons to attain stability. Similarly, Cr^{+2} acts as a reducing agent and Mn^{3+} as an oxidising agent because by losing one e^- and gaining one e^- respectively, they attain a stable electronic configuration.

e^- configuration of $\text{Cr}^{+2} \div [\text{Ar}] 3d^4 4s^0$

losing one e^- $\downarrow$ $-e^-$ (oxidises itself)

e^- configuration of $\text{Cr}^{+3} \div [\text{Ar}] 3d^3 4s^0$

$\rightarrow$ 'd³' is a stable half-filled configuration of t_{2g} orbital.
 $\therefore \text{Cr}^{+2}$ is a reducing agent.

e^- configuration of $\text{Mn}^{3+} \div [\text{Ar}] 3d^4 4s^0$

gaining one e^- $\downarrow$ $+e^-$ (reduces itself)

e^- configuration of $\text{Mn}^{+2} \div [\text{Ar}] 3d^5 4s^0$

$\rightarrow$ 'd⁵' is also a stable half-filled e^- configuration.
 $\therefore \text{Mn}^{3+}$ is an oxidising agent.

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Question-16 (OR)

Answer-16 → Tetrachloromethane which has a common name of carbon tetrachloride
(OR) and chemical formula $\Rightarrow \text{CCl}_4$.

It's a non-polar compound having tetrahedral geometry.

B • This compound is chemically very important and has many uses. Some
S of its effects on human are:-

F (i) Exposure to tetrachloromethane causes dizziness, nausea and
and severe effects on human nervous system.

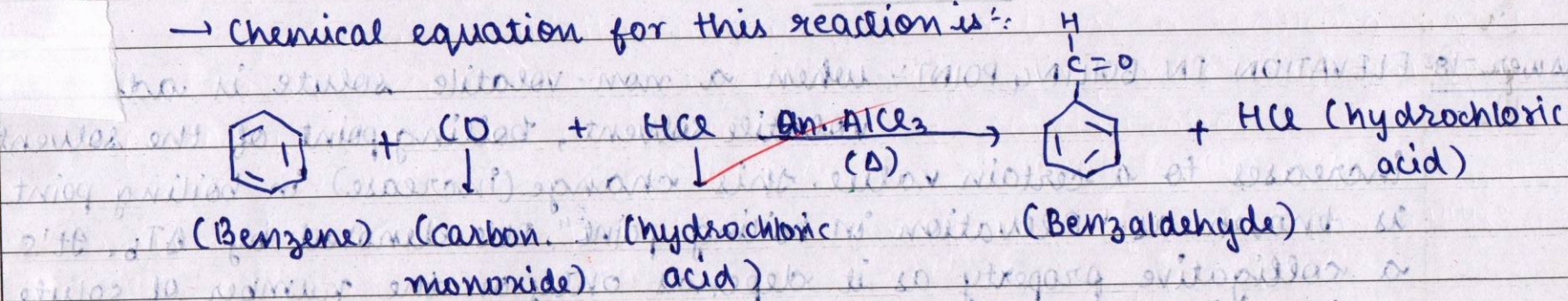
(ii) Carbon tetrachloride results in burning sensation on skin, rashes on
skin and wounds also.

(iii) Breathing in CCl_4 may cause several respiratory tract infections.
It may result in breathing issues and choking of throat.

Question-17

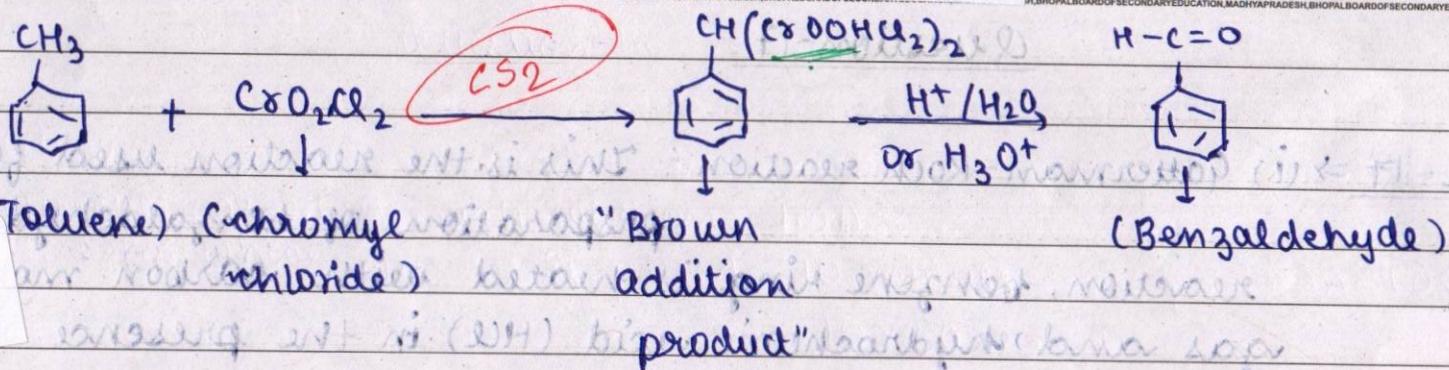
Answer-17 $\Rightarrow$ (i) Gatterman-Koch reaction: This is the reaction used for the preparation of benzaldehyde. In this reaction, benzene ring is treated with carbon monoxide (CO) gas and hydrochloric acid (HCl) in the presence of Lewis acid like anhydrous aluminium chloride ($AlCl_3$) to give benzaldehyde as a product.

$\rightarrow$ Chemical equation for this reaction is:



(ii) Etard reaction: Etard reaction is carried out to produce benzaldehyde from methyl benzene (Toluene). In this reaction, toluene is made to react with chromyl chloride (CrO_2Cl_2). Firstly, a brown addition product is formed as an intermediate. Further, this is hydrolysed to give benzaldehyde as a final product.

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Question-18

Answer-18 **ELEVATION IN BOILING POINT:** When a non-volatile solute is added to a volatile solvent, boiling point of the solvent increases to a certain value. This change (increase) in boiling point is known as 'Elevation in boiling point'. It's denoted by ΔT_b . It's a colligative property as it depends only on the number of solute particles in the solution, not on the nature of the solute particles.

Experimentally, we know that,

$$\Delta T_b = K_b \times m \quad \text{--- (1)}$$

ΔT_b : elevation in boiling point
 m : molality of the solution
 K_b : molal elevation constant.

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Let the no. of moles of solute be n_B and mass of solvent be m_A (in kg).
 Let the weight of solute in the solution be W_B and molar mass of solute be M_B .

$$\therefore m = \frac{n_B}{m_A} = \frac{W_B}{M_B \times m_A} \quad \left\{ \begin{array}{l} \text{moles} = \frac{\text{given mass}}{\text{molar mass}} \end{array} \right.$$

Substituting this in equation (1), we get;

$$\Delta T_b = K_b \times \frac{W_B}{M_B \times m_A}$$

$$M_B = \frac{K_b \times W_B}{m_A \times \Delta T_b}$$

This is the required expression.

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Question-19Answer-19

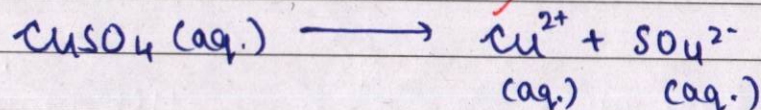
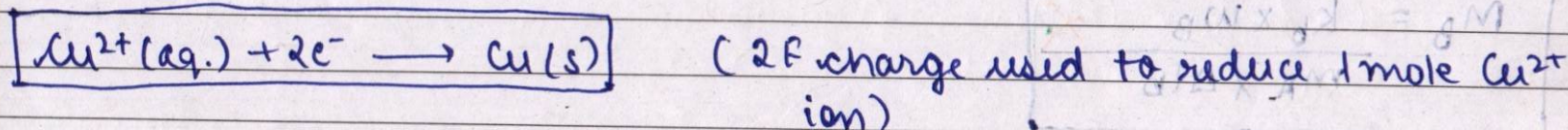
Given,

current passed through solution = 1.5A.

time for which current is passed = 10 minutes
 $\{ \because 1 \text{ min} = 60 \text{ sec.} \}$
 $= 10 \times 60 \text{ sec.}$
 $= 600 \text{ sec.}$

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• Equation of this reaction is:

→ Cu^{2+} moves towards cathode where its reduction occurs:

Using Faraday's first law of electrolysis,

$$W = zit$$

$$W = \frac{E}{F} it$$

$$W = \frac{63.5}{2} \times 1.5 \times 600$$

$$\left\{ \begin{aligned} E &= \text{equivalent weight} = \frac{\text{molar mass}}{\text{valency-factor}} \\ 1F &= 96500 \text{ C} \end{aligned} \right\}$$

• 63.5 g is the molar mass of Cu.



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$$W = 0.2961 \text{ g}$$

This amount of Cu is deposited at cathode.

Question-20

Answer-20: The products of given reactions are as follows:-

