CHEMISTRY

BOOKS - NTA MOCK TESTS

NTA JEE MOCK TEST 54

Chemistry
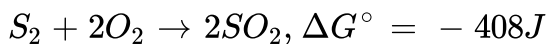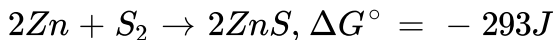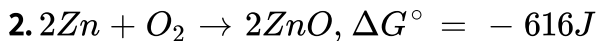
**1.** A metal oxide has the formula $Z_2O_3$ . It can be reduced by hydrogen to give free metal and water . 0.1596 g of the metal oxide requires 6 mg of hydrogen for complete reduction . The atomic weight of the metal is

A. 27.9

B. 159.6

C. 79.8

D. 55.8

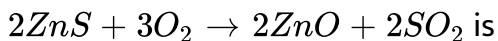**Answer: D**

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**2.** $2Zn + O_2 \rightarrow 2ZnO, \Delta G° = -616J$

$2Zn + S_2 \rightarrow 2ZnS, \Delta G° = -293J$

$S_2 + 2O_2 \rightarrow 2SO_2, \Delta G° = -408J$

$\Delta G°$ for the following reaction

$2ZnS + 3O_2 \rightarrow 2ZnO + 2SO_2$ is

A. $-713J$

B. $-1317J$

C. $-501J$

D. $+731J$

**Answer: A**

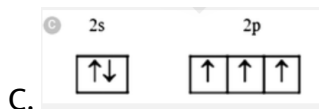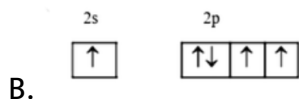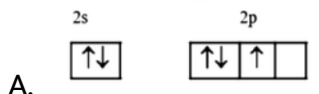**3.** Reactivity of borazole is greater than that of benzene because

A. Borazole is non - polar compound

B. Borazole is a polar compound

C. Borazole is electron deficient compound

D. Not isostructural with benzene

**Answer: B**
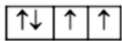
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**4.** The orbital diagram in which the Aufbau principle is violated

A.
2s
| ↑↓ |

2p
| ↑↓ | ↑ |  |

B.
2s
| ↑ |

2p
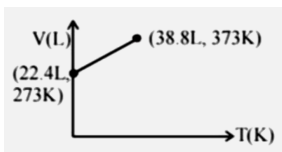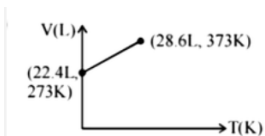| ↑↓ | ↑ | ↑ |

C.
2s
| ↑↓ |

2p
| ↑ | ↑ | ↑ |

2s    2p



D.

Answer: B

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5. Which of the following volume-temperature $(V - I)$ plots represents the behaviour of 1mole of an ideal gas at the atmospheric pressure?
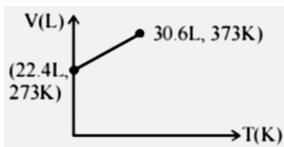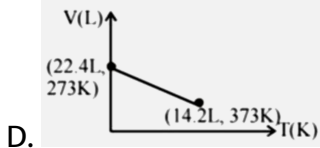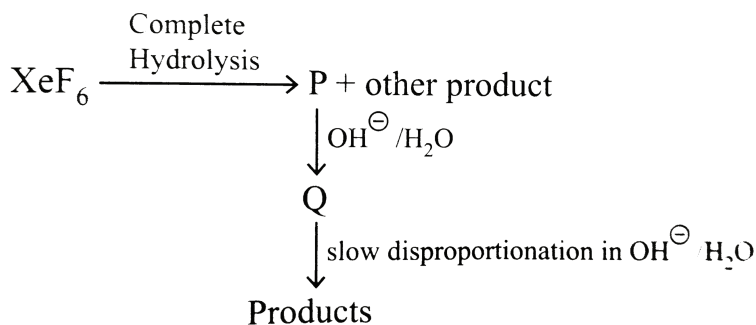
A.


B.


C.

D.

**Answer: C**

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**6.** Under ambient condition , the total number of gases released products in the final step of the reaction scheme shown below is

$$XeF_6 \xrightarrow[\text{Hydrolysis}]{\text{Complete}} P + \text{other product}$$

$$\downarrow OH^{\ominus}/H_2O$$

$$Q$$

$$\downarrow \text{slow disproportionation in } OH^{\ominus}/H_2O$$

$$\text{Products}$$

A. 0

B. 1

C. 2

D. 3

**Answer: C**

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**7.** Which of the following is more basic than aniline? .

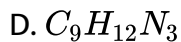A. Diphenylamine

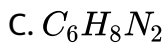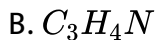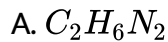B. Triphenylamine

C. p - nitroaniline

D. Benzylamine

**Answer: D**

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**8.** In a compound $C, H, N$ atoms are present in $9:1:3.5$ by weight. Molecular weight of compound is $108$. Its molecular formula is:
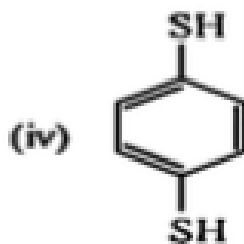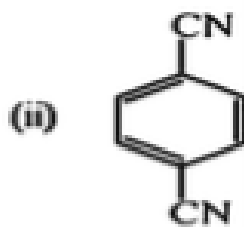
A. $C_2H_6N_2$

B. $C_3H_4N$

C. $C_6H_8N_2$

D. $C_9H_{12}N_3$

**Answer: C**

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**9.** For which of the following molecule significant $\mu \neq 0$?



(i) 1,4-dichlorobenzene

(ii) 1,4-dicyanobenzene (benzene-1,4-dicarbonitrile)

(iii) benzene-1,4-diol

(iv) benzene-1,4-dithiol
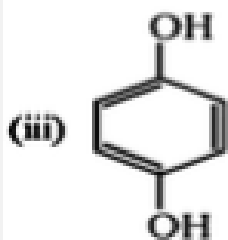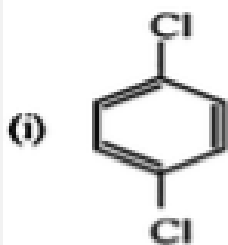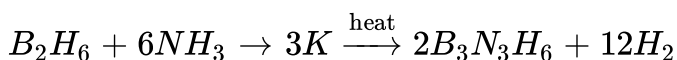
A. only (i)

B. (i) and (ii)

C. only (iii)

D. (iii) and (iv)

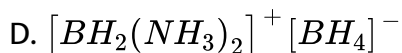**Answer: D**
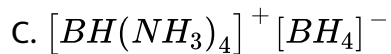
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**10.** The correct statement is

A. leaching of bauxite using concentrated $NaOH$ solution gives sodium aluminate and sodium silicate

B. the blistered apperance of copper during the metallurgical process is due to the evoluation of $CO_2$

C. pig iron is obtained from cast iron

D. the Hall - Heroult process is used for the production of aluminium and iron

**Answer: A**

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**11.** The intermediate product (X) formed in the following reaction is

$$B_2H_6 + 6NH_3 \rightarrow 3K \xrightarrow{\text{heat}} 2B_3N_3H_6 + 12H_2$$

A. $\left[BH(NH_3)_3\right]^+\left[BH_4\right]^-$

B. $\left[BH_2(NH_3)_4\right]^+\left[BH_4\right]^-$

C. $\left[BH(NH_3)_4\right]^+\left[BH_4\right]^-$

D. $\left[BH_2(NH_3)_2\right]^+\left[BH_4\right]^-$
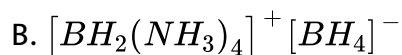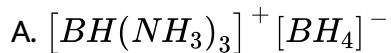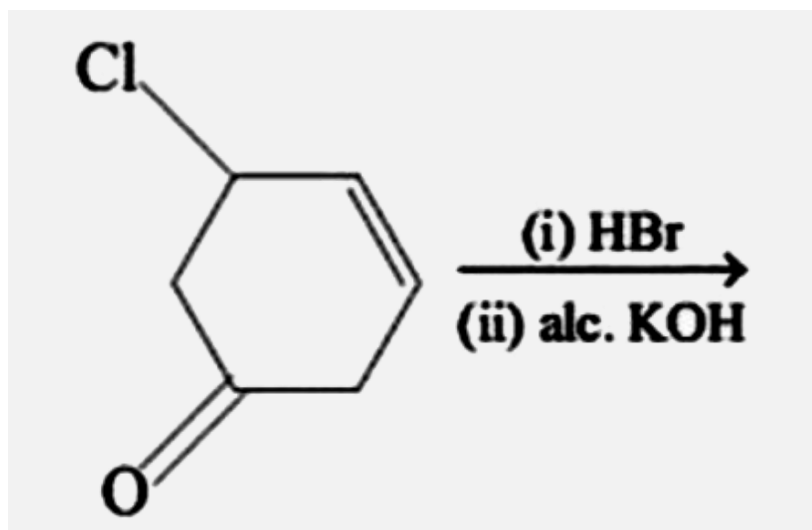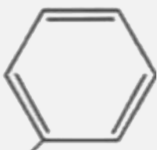
Answer: D

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12. The major product of the following reactions is

A. 

B. 

C. 

D. 
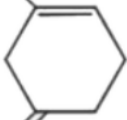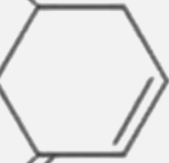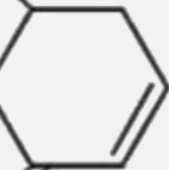
**Answer: A**

**13.** Product (X and Y) of the following reaction (1 and 2) are

(1) $\underset{\text{(Cold and dilute)}}{2NaOH} + Cl_2 \rightarrow NaCl + X + H_2O$

(2) $\underset{\text{(Hot and conc.)}}{6NaOH} + 3Cl_2 \rightarrow NaCl + Y + 3H_2O$

A. $X = NaClO_3$ and $Y = NaOCl$

B. $X = NaOCl$ and $Y = NaClO_3$

C. $X = NaHClO_3$ and $Y = NaOCl$

D. $X = NaClO_3$ and $Y = NaHClO_3$
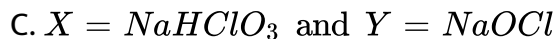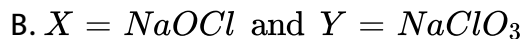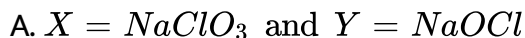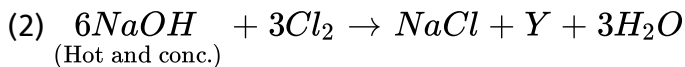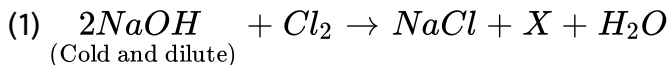
**Answer: B**

**14.** In a galvanic cell, after running the cell for sometimes, the

concentration of the electrolyte is automatically raised to 3 M HCl.

Molar conductivity of the 3 M HCl is about $240 \text{ S cm}^2 \text{ mol}^{-1}$ and limiting molar conductivity of HCl is about $420 \text{ S cm}^2 \text{ mol}^{-1}$. If $K_b$ of water is $0.52 \text{ K kg mol}^{-1}$, calculate the boiling point of the electrolyte at the end of the experiment.

A. 375.6 K

B. 376.3 K

C. 378.1 K

D. 380.3 K

**Answer: A**

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**15.** Addition of excess aqueous ammonia to a pink coloured aqueous solution of $MCl_2. 6H_2O(X)$ and $NH_4Cl$ gives an octahedral complex Y in the presence of air. In aqueous solution, complex Y behaves as 1:3 electrolyte. The reaction of X with excess HCl at room

temperature results in the formation of a blue coloured complex Z. The calculated spin only magnetic moment of X and Z is 3.87 B.M., whereas it is zero for complex Y.

Among the following options, which statement is incorrect ?

A. The hybridization of the central metal ion in Y is $d^2sp^3$

B. Addition of silver nitrate to Y gives only two equivalents of silver chloride

C. When X and Z are in equilibrium at $0°C$, the colour of the solution is pink

D. Z is a tetrahedral complex

Answer: B
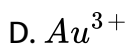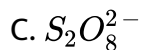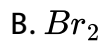
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16. Given that $E^{\ominus}_{O_2/H_2O} = +1.23V$, $E^{\ominus}_{S_2O_8^{2-}/SO_4^{2-}} = 2.05V$, $E^{\ominus}_{Br_2/Br^-} = +1.09V$, $E_{Au^{3+}/Au^{\ominus}} = +1.4V$

The strongest oxidizing agent is :

A. $O_2$

B. $Br_2$

C. $S_2O_8^{2-}$

D. $Au^{3+}$

**Answer: C**

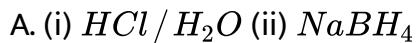▶ **Watch Video Solution**

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17. Which of the following is NOT a Correct method of the preparation of benzylamine from cyanobenzene?

A. (i) $HCl/H_2O$ (ii) $NaBH_4$

B. (i) $LiAlH_4$ (ii) $H_3O^+$

C. (i) $SnCl_2 + HCl$ (ii) $NaBH_4$

D. $H_2, Ni$
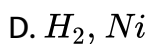
**Answer: A**

18. The equalitative sketches I, II and III given below show the variation of surface tension with molar concentration of three diferent aqueous solutions of $KCl$, $CH_3OH$ and $CH_3(CH_2)_{11}OSO_3^- Na^+$ at room temperature.
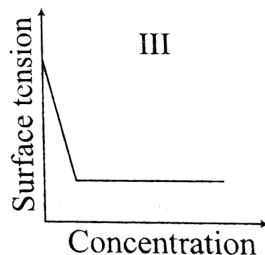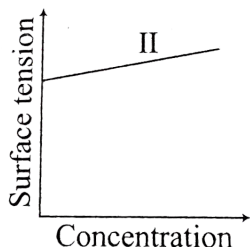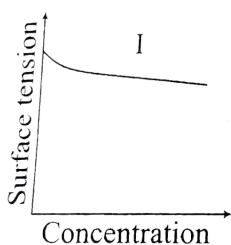


The correct assignment of the sketches is

A. $I. KCl$,

$II. CH_3OH$,

$III. CH_3(CH_2)_{11}OSO_3^- Na^+$

B. I. $CH_3(CH_2)_{11}OSO_3^- Na^+$,

II. $CH_3OH$,

III. $KCl$

C. I. $KCl$,

II. $CH_3(CH_2)_{11}OSO_3^- Na^+$,

III. $CH_3OH$

D. I. $CH_3OH$,

II. $KCl$,

III. $CH_3(CH_2)_{11}OSO_3^- Na^+$
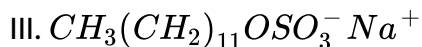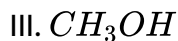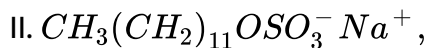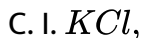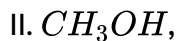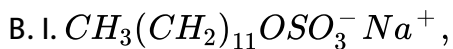
**Answer: D**

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**19.** What is the IUPAC nomenclature of isoprene monomer present in natural rubber?

A. 2 - methyl -1, 3 - butadiene

B. 1, 3- Hexadiene

C. 2, 3 - Dimethyl -1, 3 - butadiene

D. 2 - Methyl-1, 3 - pentadiene

Answer: A

**20.** What is the relationship between the given structures (look at the arrow)?



A. Enantiomers

B. Anomers

C. Diastereomers

D. Metamers

**Answer: B**

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**21.** In dilute aqueous $H_2SO_4$ the complete diaquadioxalatoferrate (II) is oxidised by $MnO_4^-$. For the reaction, the ratio of the rate of change of $[H^+]$ to the rate of change of $[MnO_4^-]$ is
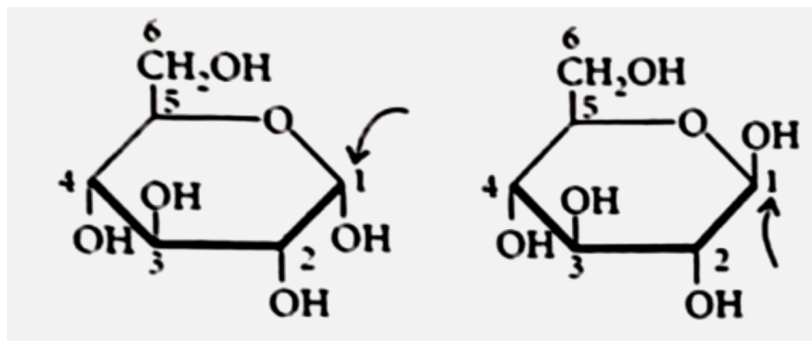
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**22.** A list of species having the formula of $XZ_4$ is given below

$XeF_4$, $SF_4$, $SiF_4$, $BF_4^-$, $BrF_4^-$, $[Cu(NH_3)_4]^{2+}$, $[FeCl_4]^{2-}$, $[CoCl_4]^{2-}$ and $[PtCl_4]^{2-}$

Defining shape on the basis of the location of $X$ and $Z$ atoms, the total number of species having a square planar shape is
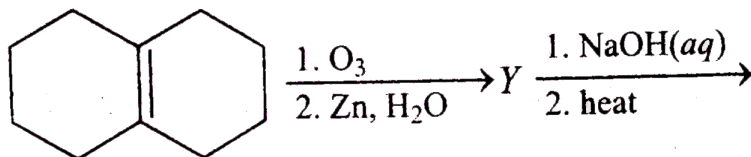
**23.** Experimentally it was found that a metal oxide in formula $M_{0.98}O$. Metal $M$ is present as $M^{2+}$ and $M^{3+}$ in its oxide ,Fraction of the metal which exists as $M^{3+}$ would be

**24.** In a constant volume calorimeter, $3.5g$ of a gas with molecular weight $28$ was burnt in excess oxygen at $298.0K$. The temperature of the calorimeter was found to increase from $298.0K \rightarrow 298.45K$ due to the combustion process. Given that the heat capacity of the calorimeter is $2.5kJK^{-1}$, find the numerical value for the enthalpy of combustion of the gas in $kJmol^{-1}$

**25.** In the scheme given below. The total number of intramolecular aldol condensation products formed form Y is



$$\text{1. } O_3 \atop \text{2. } Zn, H_2O \longrightarrow Y \xrightarrow{\text{1. NaOH}(aq) \atop \text{2. heat}}$$

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