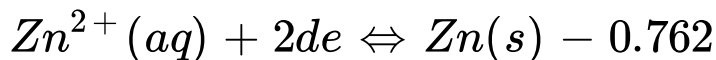# CHEMISTRY
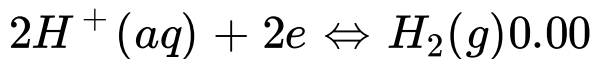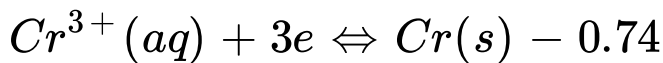
BOOKS - NTA MOCK TESTS

ELECTROCHEMISTRY TEST
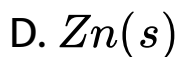
Single Choice

1. The standard reduction potentials at 298 K for the following half reactions are given against each

$$Zn^{2+}(aq) + 2de \Leftrightarrow Zn(s) - 0.762$$

$$Cr^{3+}(aq) + 3e \Leftrightarrow Cr(s) \quad -0.74$$

$$2H^+(aq) + 2e \Leftrightarrow H_2(g) \quad 0.00$$

$$Fe^{3+}(aq) + e \Leftrightarrow Fe^{2+}(aq) \quad 0.77$$

Which is the stronger reducing agent ?

A. $Fe^{2+}(aq)$

B. $H_2(g)$

C. $Cr(s)$

D. $Zn(s)$
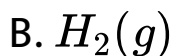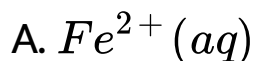
Answer: D

2. The molar conductivity of a 1.5 M solution of an electrolyte is found to be $138.9 Scm^2 mol^{-1}$. Calculate the conductivity of the solution.

A. $1.023 Scm^{-1}$

B. $0.026 Scm^{-1}$

C. $0.208 Scm^{-1}$

D. $0.325 Scm^{-1}$

Answer: C

> ▶ View Text Solution

3. How much chlorine will be liberated on passing one ampere current for 30 minutes through NaCl solution ?

    A. 0.66 mole

    B. 0.33 mole

    C. 0.66 g

    D. 0.33 g

Answer: C

▶ **View Text Solution**

4. What is the cell constant of a cell of KCI containing $N/50$ solution, if the conductivity and resistance of cell is $0.002765 Scm^{-1}$ and 400 ohm respectively.

A. $6.91 cm^{-1}$

B. $1.106 cm^{-1}$

C. $14.46 cm^{-1}$

D. $2.212 cm^{-1}$

Answer: B

▶ View Text Solution

5. The reduction of NO_3^- occurs as :

$$NO_3^- + 4H^+ + 3e^- \rightarrow NO + 2H_2O, \ E^\circ = 0.96V$$

The electrons are provided by Cd till that the solution originally having $0.1MNO_3^-$ and $0.4MH^+$ shows that 80% of NO_3^- ions are converted to NO showing 1 bar pressure. The reduction potential of remaining solution. [log 8.192 = 0.96]

    A. 0.84 V

    B. 1.36 V

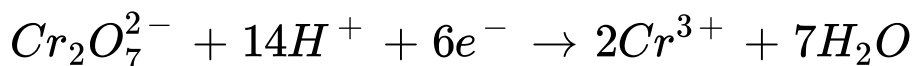   C. 1.08 V

D. 1.56 V

Answer: A

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6. Consider the reaction,

$$Cr_2O_7^{2-} + 14H^+ + 6e^- \rightarrow 2Cr^{3+} + 7H_2O$$

What is the quantity of electricity in coulombs needed to reduce 1 mole of $2Cr_2O_7^{2-}$?

(Given 1F= 96500C)

A. 5.79×10^5

B. 5.69×10^5

C. 5.59×10^5

D. 5.49×10^5

Answer: A

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7. Suggest a list of metals that are extracted electrolytically.

A. Na, K, Mg, Ca

B. Na, K, Mg, Cr

C. Na, K, Mg, Fe

D. Na, K, Mg, Co

Answer: A

▶ **View Text Solution**

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8. By diluting a weak electrolyte, specific conductivity (K_c) and equivalent conductivity $(\lambda_c$) change as

A. Both increase

B. K increases, λ_c decreases

C. K_c decreases, λ_c increases

D. Both decrease

Answer: C

▶ **View Text Solution**

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9. Two different electrolytic cells filled with molten $Cu(NO_3)_2$ and molten $AI(NO_3)_3$ respectively are connected in series. When electricity is passed 2.7 g Al is deposited on electrode. Calculate the weight of Cu deposited on cathode. [Cu = 63.5, $Al = 27.0 gmol^{-1}$]

A. 190.5 g

B. 9.525 g

C. 63.5 g

D. 31.75 g

Answer: B

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10. A silver cup is plated with silver by passing 965 C of electricity. The amount of Ag deposited is

A. 107.89 g

B. 9.89 g

C. 1.0002 g

D. 1.08 g

Answer: D

▶ **View Text Solution**

11. When X amperes of current is passed through molten $AlCl_3$ for 96.5 s. 0.09 g of aluminium is deposited. What is the value of X?

A. 10

B. 20

C. 30

D. 40

Answer: A

▶ **View Text Solution**

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12. The amount of silver deposited by passing 241.25 C of charge through silver nitrate solution is

A. 2.7 g

B. 2.7 mg

C. 0.27 g

D. 0.54 g

Answer: C

▶ **View Text Solution**

13. The number of coulombs required for the deposition of 107.870 g silver is

A. 96500

B. 48250

C. 1

D. 10000

Answer: A

▶ **View Text Solution**

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14. During electrolysis of water the volume of O_2 liberated is $2.24dm^3$. The volume of hydrogen liberated, under same conditions will be

A. $2.24dm^3$

B. $1.12dm^3$

C. $4.48 dm^3$

D. $0.56 dm^3$

Answer: C

▶ **View Text Solution**

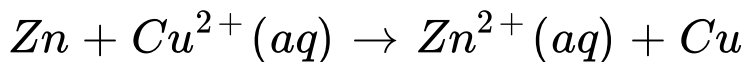**15.** H_2 cannot be displaced by

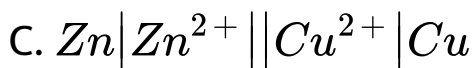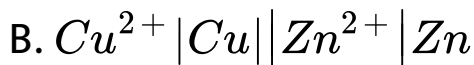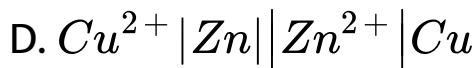A. Li

B. Sr

C. Al

D. Ag

Answer: D

▶ **View Text Solution**

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16. For a cell reaction,

$$Zn + Cu^{2+}(aq) \rightarrow Zn^{2+}(aq) + Cu$$

Cell representation is

    A. $Cu^{2+}|Cu||Zn|Zn^{2+}$

    B. $Cu^{2+}|Cu||Zn^{2+}|Zn$

    C. $Zn|Zn^{2+}||Cu^{2+}|Cu$

D. $Cu^{2+}|Zn||Zn^{2+}|Cu$

Answer: C

▶ **View Text Solution**

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17. The standard reduction potential E for the half

reactions are as:

$$Zn^{2+} + 2e^- \rightarrow Zn \qquad E^\circ = -0.76V$$

$$Cu^{2+} + 2e^- \rightarrow Cu, \ E^\circ = 0.34V$$
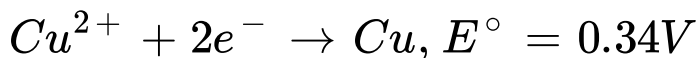
The standard cell voltage for the cell reaction is?

$$Zn + Cu^{2+} \rightarrow Zn^{2+} + Cu$$
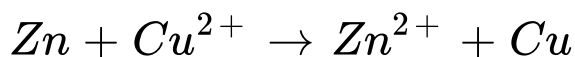
A. 0.42 V

B. -0.42 V

C. -1.1 V

D. 1.10 V

Answer: D

▶ View Text Solution

18. When 9.65 C of electricity is passed through a solution of silver nitrate (atomic weight of Ag =

107.87 taking as 108), the amount of silver deposited is

A. 5.8 mg

B. 10.8 mg

C. 15.8 mg

D. 20.8 mg

Answer: B

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19. On passing 0.1 F of electricity through molten solution of. Al_2O_3 amount of aluminium metal deposited at cathode is (Al = 27)

A. 0.3 g

B. 0.6 g

C. 0.9 g

D. 1.2 g

Answer: C

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20. On passing 3 A of electricity for 50 min, 1.8 g metal deposits. The equivalent mass of metal is

A. 9.3

B. 19.3

C. 38.3

D. 39.9

Answer: B

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21. 3 Faradays of electricity was passed through an aqueous solution of iron (II) bromide. The weight of iron metal (at. wt. = 56) deposited at the cathode (in g) is

A. 65

B. 84

C. 112

D. 168

Answer: B

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22. Standard reduction electrode potentials of three metals A,B and C are respectively + 0.5 V, -3.0 V and -1.2 V. The reducing powers of these metals are:

A. $A > B > C$

B. $C > B > A$

C. $A > C > B$

D. $B > C > A$

Answer: D

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23. Which of the following is not correct?

A. he metallic conduction is due to the movement of electrons in the metal

B. The electrolytic conduction is due to the movement of ions in the solution

C. The current carrying ions are not necessarily discharged at the electrodes

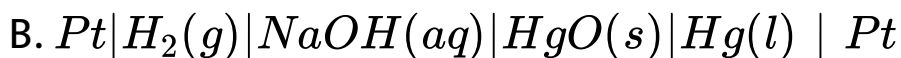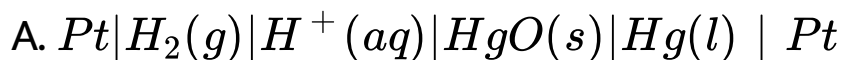D. The metallic conduction increases with the increase in temperature, whereas that of
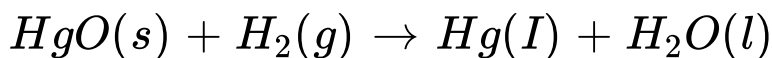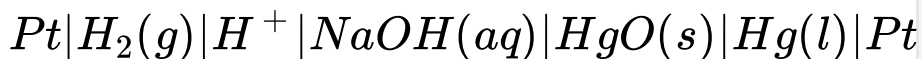
electrolytic conduction decreases with temperature.

Answer: D

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24. In which of the following electrochemical cell overall cell reaction is :

$$HgO(s) + H_2(g) \rightarrow Hg(I) + H_2O(l)$$

A. $Pt|H_2(g)|H^+(aq)|HgO(s)|Hg(l) \mid Pt$

B. $Pt|H_2(g)|NaOH(aq)|HgO(s)|Hg(l) \mid Pt$

C.

$$Pt|H_2(g)|H^+|NaOH(aq)|HgO(s)|Hg(l)|Pt$$

D. $Pt|H_2(g)|H^+||HgO(s)|Hg(l)|Pt$

Answer: B

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25. The equivalent conductivity of 0.1 M weak acid is 100 times lesser than that at infinite dilution. The degree of dissociation of weak electrolyte at 0.1 M is -
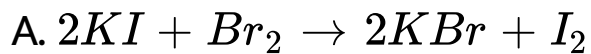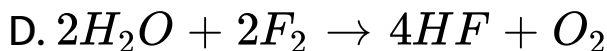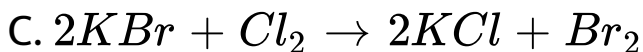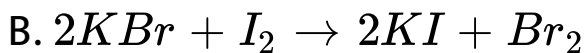
A. 100

B. 10

C. 0.01

D. 0.001

Answer: C

▶ **View Text Solution**

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26. Which reaction is not feasible ?

A. $2KI + Br_2 \rightarrow 2KBr + I_2$

B. $2KBr + I_2 \rightarrow 2KI + Br_2$

C. $2KBr + Cl_2 \rightarrow 2KCl + Br_2$

D. $2H_2O + 2F_2 \rightarrow 4HF + O_2$

Answer: B

▶ **View Text Solution**

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27. At 298 K, the molar conductivities at infinite dilution ($\wedge_m^\circ$) of NH_4CI, KOH and KCl are 152.8, 272.6 and $149.8 Scm^2 mol^{-1}$ respectively. The $\wedge_m^\circ$ of NH_4OH in $Scm^2 mol^{-1}$ and % dissociation of $0.01 M NH_4OH$ with

$\wedge m = 25.1 Scm^2 mol^{-1}$ at the same temperature are

A. 275.6, 0.91

B. 275.6, 9.1

C. 266.6, 9.6

D. 30, 84

Answer: B

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28. Suppose that gold is being plated on to another metal in an electrolytic cell. The half-cell reaction producing the Au(s) is $AuCl_4^- + 3^- \rightarrow Au(s) + 4Cl^-$. If a 0.30 A current runs for 15 min, what mass of Au(s) will be plated, assume all the electrons are used in the reduction of $AuCl_4^-$? The Faraday constant is $96485C/\mathrm{mol}$ and molar mass of Au is 197.

A. 0.184 g

B. 0.551 g

C. 1.84 g

D. 0.613 g

Answer: A

> ▶ **View Text Solution**

29. The products obtained at the cathode and anode respectively during the electrolysis of aqueous K_2SO_4 solution using platinum electrodes are

A. O_2, H_2

B. H_2O_2

C. H_2, SO_2

D. K, SO_2

Answer: B

▶ **View Text Solution**

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30. A conductance cell when filled with 0.5 M KCl solution (conductivity $=6.67 \times 10^{-3}\Omega cm^{-1}$) registers a -3 resistance of 243Ω. What will be the cell constant?

A. 1.62 cm

B. $1.62 cm^{-1}$

C. $1.62 dm^{-1}$

D. $1.62 m^{-1}$

Answer: B

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