# 100 Electrochemistry Numerical Problems with Answers

## Section A: Basic Concepts (1–20)

1. Calculate charge passed by 2 A current in 5 s.
   **Ans:** 10 C
2. How many electrons in 1 C?
   **Ans:** 6.25×1018
3. Charge for 2 mol electrons?
   **Ans:** 193000 C
4. Faraday constant value?
   **Ans:** 96500 C/mol
5. Current for 100 C in 10 s?
   **Ans:** 10 A
6. Time for 500 C at 5 A?
   **Ans:** 100 s
7. Charge for 0.5 mol electrons?
   **Ans:** 48250 C
8. Current if 200 C in 20 s?
   **Ans:** 10 A
9. Time for 96500 C at 1 A?
   **Ans:** 96500 s
10. Charge for 3 A in 2 min?
    **Ans:** 360 C
11. 1 F equals?
    **Ans:** 96500 C
12. Charge for 1 mol electrons?
    **Ans:** 96500 C
13. Current for 300 C in 30 s?
    **Ans:** 10 A
14. Time for 1000 C at 2 A?
    **Ans:** 500 s
15. Charge passed in 4 A for 25 s?
    **Ans:** 100 C
16. Current for 400 C in 40 s?
    **Ans:** 10 A
17. Charge for 1.5 mol electrons?
    **Ans:** 144750 C

18. Time for 200 C at 4 A?
    **Ans:** 50 s
19. Current for 600 C in 60 s?
    **Ans:** 10 A
20. Charge in 10 A for 10 s?
    **Ans:** 100 C

## Section B: Faraday's Laws (21–50)

21. Mass of Ag deposited by 96500 C?
    **Ans:** 108 g
22. Cu deposited by 193000 C (n=2)?
    **Ans:** 63.5 g
23. Al deposited by 289500 C (n=3)?
    **Ans:** 27 g
24. Zn deposited by 193000 C?
    **Ans:** 65.4 g
25. Charge for 1 g Ag?
    **Ans:** 893 C
26. Mass Cu by 96500 C?
    **Ans:** 31.75 g
27. Ag deposited by 48250 C?
    **Ans:** 54 g
28. Mass Fe by 193000 C (n=2)?
    **Ans:** 55.8 g
29. Charge for 2 g Cu?
    **Ans:** 6079 C
30. Mass Zn by 96500 C?
    **Ans:** 32.7 g
31. Al by 96500 C?
    **Ans:** 9 g
32. Charge for 10 g Ag?
    **Ans:** 8935 C
33. Mass Cu by 48250 C?
    **Ans:** 15.9 g
34. Zn by 48250 C?
    **Ans:** 16.35 g
35. Fe by 96500 C?
    **Ans:** 27.9 g
36. Charge for 5 g Al?
    **Ans:** 5350 C
37. Cu by 289500 C?
    **Ans:** 95.25 g

38. Ag by 193000 C?
    **Ans:** 216 g
39. Zn by 289500 C?
    **Ans:** 98.1 g
40. Fe by 289500 C?
    **Ans:** 83.7 g
41. Charge for 1 mol Cu?
    **Ans:** 193000 C
42. Ag by 1 F?
    **Ans:** 108 g
43. Zn by 1 F?
    **Ans:** 32.7 g
44. Cu by 2 F?
    **Ans:** 63.5 g
45. Fe by 2 F?
    **Ans:** 55.8 g
46. Al by 3 F?
    **Ans:** 27 g
47. Zn by 2 F?
    **Ans:** 65.4 g
48. Ag by 0.5 F?
    **Ans:** 54 g
49. Cu by 0.5 F?
    **Ans:** 15.9 g
50. Fe by 0.5 F?
    **Ans:** 13.95 g

## Section C: EMF and Nernst Equation (51–80)

51. EMF if $E^\circ = 1.1$ V?
    **Ans:** 1.1 V
52. EMF for Daniell cell?
    **Ans:** 1.10 V
53. If $[Zn^{2+}]=1M$, $[Cu^{2+}]=1M$?
    **Ans:** 1.10 V
54. EMF if $[Zn^{2+}]=0.1$, $[Cu^{2+}]=1$?
    **Ans:** 1.13 V
55. EMF if $[Zn^{2+}]=1$, $[Cu^{2+}]=0.1$?
    **Ans:** 1.07 V
56. EMF at equilibrium?
    **Ans:** 0 V
57. n value for Zn-Cu cell?
    **Ans:** 2

58. Log 10 value?
    **Ans:** 1
59. EMF if Q=1?
    **Ans:** E°
60. EMF decreases with?
    **Ans:** Increase in Q
61. EMF increases with?
    **Ans:** Decrease in Q
62. EMF at high temp?
    **Ans:** Slight change
63. E° cell formula?
    **Ans:** Cathode − Anode
64. Sign of spontaneous EMF?
    **Ans:** Positive
65. EMF if Q>1?
    **Ans:** Decreases
66. EMF if Q<1?
    **Ans:** Increases
67. Standard condition temp?
    **Ans:** 298 K
68. Nernst factor at 298K?
    **Ans:** 0.0591
69. Unit of EMF?
    **Ans:** Volt
70. Relation EMF & ΔG?
    **Ans:** Negative
71. ΔG sign for spontaneous?
    **Ans:** Negative
72. EMF at equilibrium?
    **Ans:** Zero
73. n for $Ag^{+} \rightarrow Ag$?
    **Ans:** 1
74. n for $Al^{3+} \rightarrow Al$?
    **Ans:** 3
75. EMF for non-spontaneous?
    **Ans:** Negative
76. Effect of concentration?
    **Ans:** Changes EMF
77. Standard EMF symbol?
    **Ans:** E°
78. Unit of ΔG?
    **Ans:** J
79. Relation ΔG =?
    **Ans:** −nFE

80. EMF for electrolytic cell?
    **Ans:** Negative

## Section D: Conductance (81–100)

81. Unit of conductance?
    **Ans:** Siemens
82. Unit of conductivity?
    **Ans:** S $cm^{-1}$
83. Molar conductivity unit?
    **Ans:** S $cm^2$ $mol^{-1}$
84. Conductance inverse of?
    **Ans:** Resistance
85. Resistance unit?
    **Ans:** Ohm
86. Conductivity increases with dilution?
    **Ans:** Yes
87. Molar conductivity increases?
    **Ans:** Yes
88. Strong electrolyte dissociation?
    **Ans:** Complete
89. Weak electrolyte dissociation?
    **Ans:** Partial
90. Kohlrausch's law applies to?
    **Ans:** Weak electrolytes
91. Conductivity depends on?
    **Ans:** Ions
92. Temperature effect?
    **Ans:** Increases conductivity
93. Cell constant unit?
    **Ans:** $cm^{-1}$
94. Resistance relation?
    **Ans:** $R = \rho l/A$
95. Conductivity symbol?
    **Ans:** $\kappa$
96. Molar conductivity symbol?
    **Ans:** $\Lambda m$
97. Limiting conductivity?
    **Ans:** Infinite dilution
98. Ionic mobility increases?
    **Ans:** With dilution
99. Conductivity of pure water?
    **Ans:** Very low

100. Electrolytes conduct by?

**Ans:** Ions