

DPP – 8

CONDUCTANCE

Chapter: Electrochemistry • Complete Solutions

“Do this assignment not for me, not for marks — but for your own growth.”

Quick Answer Key

- | | | | | | | | | | |
|--------|--------|---------|--------|---------|---------|---------|---------|---------|---------|
| 1. (4) | 2. (2) | 6. (4) | 7. (3) | 11. (4) | 12. (2) | 16. (2) | 17. (3) | 21. (3) | 22. (1) |
| 3. (2) | 4. (4) | 8. (2) | 9. (1) | 13. (1) | 14. (3) | 18. (1) | 19. (1) | 23. (1) | 24. (1) |
| 5. (3) | | 10. (1) | | 15. (3) | | 20. (3) | | 25. (4) | |

TYPE-1 : Basic Conductance & Resistance Concepts

1 Cell constant is maximum in case of

[NCERT Pg. 75]

Explanation

The cell constant (G^*) is defined as:

$$G^* = \frac{l}{A}$$

where l = distance between electrodes, A = cross-sectional area. It is a purely *geometric* property of the conductivity cell.

Evaluating all four options:

$$\text{Option (1): } \frac{100}{100} = 1 \quad \text{Option (2): } \frac{10}{10} = 1 \quad \text{Option (3): } \frac{1}{1} = 1$$

All three give $G^* = 1 \text{ cm}^{-1}$ (or m^{-1} in SI).

Approach & Analogy

Analogy: Think of cell constant like the "difficulty score" of a pipe for water flow — it's (Length / Area). Here, all three cases have the same length-to-area ratio, like three different pipes that are equally hard to push water through. So the difficulty is the same for all!

Answer

Option (4) — Equal in all cases

$$G^* = \frac{l}{A} = 1 \text{ for all options}$$

2 Resistance of decimolar solution is 50 ohm. Electrodes: area = 0.0004 m^2 , distance = 0.02 m . Conductivity?

Explanation

Unit conversion first (always work in cm for conductance problems):

$$A = 0.0004 \text{ m}^2 = 0.0004 \times 10^4 \text{ cm}^2 = 4 \text{ cm}^2$$

$$l = 0.02 \text{ m} = 2 \text{ cm}$$

$$G^* = \frac{l}{A} = \frac{2}{4} = 0.5 \text{ cm}^{-1}$$

Now, conductivity:

$$\kappa = \frac{G^*}{R} = \frac{0.5}{50} = 0.01 \text{ S cm}^{-1}$$

Approach & Analogy

Analogy: κ (conductivity) is like the "quality" of the road (solution). Resistance (R) is how hard it is to drive. Cell constant (G^*) is like the road's shape (length/width). The formula $\kappa = G^*/R$ means: better road quality = lower resistance for the same shape.

Answer

Option (2) $\kappa = 0.01 \text{ S cm}^{-1}$

3 Specific conductance of 0.1 N KCl at 23°C is 0.012 ohm⁻¹cm⁻¹. Resistance of cell = 55 ohm. Find cell constant.

Explanation

From the fundamental relation:

$$\kappa = G \times G^* = \frac{G^*}{R}$$

Therefore:

$$G^* = \kappa \times R = 0.012 \times 55 = \boxed{0.66 \text{ cm}^{-1}}$$

This is exactly how we **calibrate** a conductivity cell in lab — we use a known solution (like KCl) to determine the cell constant of our instrument!

Approach & Analogy

Analogy: It's like calibrating a measuring scale. You put a known weight (KCl solution with known κ) on the scale (cell), read the display (resistance = 55 Ω), and back-calculate the scale factor (cell constant).

Answer

Option (2) $G^* = 0.66 \text{ cm}^{-1}$

4 Resistance of 0.0025 M K₂SO₄ is 326 ohm. Cell constant = 4 cm⁻¹. Find

specific conductance.

Explanation

Using the standard formula:

$$\kappa = \frac{G^*}{R} = \frac{4}{326} \approx 1.227 \times 10^{-2} \text{ S cm}^{-1}$$

Among the options, this is closest to **option (4)**: 1.20×10^{-2} .

Approach & Analogy

Approach: Cell constant \div Resistance = Conductivity. Think of it as: the "road shape" (cell constant) divided by the "traffic jam factor" (resistance) gives you the "road quality" (conductivity).

Answer

Option (4) $\kappa \approx 1.20 \times 10^{-2} \text{ S cm}^{-1}$

5 Specific conductances: **P** (5×10^{-8}), **Q** (7×10^{-8}), **R** (1×10^{-10}), **S** (9.2×10^{-3}).
Highest resistance?

Explanation

Resistance $\propto \frac{1}{\kappa}$ (conductance). The electrolyte with the **lowest** specific conductance offers the **highest** resistance.

Comparing: $R = 1.0 \times 10^{-10}$ is the smallest value among all four.

$$\kappa_R < \kappa_P < \kappa_Q \ll \kappa_S$$

Approach & Analogy

Analogy: Conductance is like how easily you can talk through a wall. A thicker, denser wall (lower conductance) means more resistance. **R** has the thickest wall — it lets almost no current pass!

Answer

Option (3): R $\kappa_R = 1.0 \times 10^{-10} \text{ ohm}^{-1} \text{ cm}^{-1}$ (minimum $\kappa \Rightarrow$ maximum resistance)

TYPE-2 : Molar Conductance Calculations

Key Formula: Molar Conductance

$$\Lambda_m = \frac{\kappa \times 1000}{C_M} \quad (\text{when } \kappa \text{ in S cm}^{-1}, C_M \text{ in mol L}^{-1}) \quad \Lambda_m = \frac{\kappa}{C_M} \quad (\text{in SI units})$$

where C_M is molarity in mol/m³ (SI) or use the 1000-factor when working in cgs.

6 Molar conductivity of 0.5 mol/dm³ AgNO₃ with $\kappa = 5.76 \times 10^{-3}$ S cm⁻¹ at 298 K?**Explanation**

$$0.5 \text{ mol/dm}^3 = 0.5 \text{ mol/L} = 0.5 \text{ M}$$

$$\Lambda_m = \frac{\kappa \times 1000}{C_M} = \frac{5.76 \times 10^{-3} \times 1000}{0.5} = \frac{5.76}{0.5} = 11.52 \text{ S cm}^2 \text{ mol}^{-1}$$

Approach & Analogy

Analogy: Molar conductance = how well *one mole* of ions conducts. We dilute the conductivity to 1 molar level: $\kappa \times 1000$ spreads it over 1000 mL (1 L), then divide by moles present.

Answer

Option (4) $\Lambda_m = 11.52 \text{ S cm}^2 \text{ mol}^{-1}$

7 Specific conductance of 0.01 M salt = 1.061×10^{-4} S cm⁻¹. Molar conductance?**Explanation**

$$\Lambda_m = \frac{\kappa \times 1000}{C_M} = \frac{1.061 \times 10^{-4} \times 1000}{0.01} = \frac{1.061 \times 10^{-1}}{0.01} = 10.61 \text{ S cm}^2 \text{ mol}^{-1}$$

Answer

Option (3) $\Lambda_m = 10.61 \text{ S cm}^2 \text{ mol}^{-1}$

8 Specific conductivity of 0.01 N H₂SO₄ = 6×10^{-3} S cm⁻¹. Molar conductivity?**Explanation**

For H₂SO₄: n -factor = 2. So: $M = N/2 = 0.01/2 = 0.005 \text{ M}$

Using the equivalent conductance approach (which several JEE sources call “molar conduc-

tance” for diprotic acids using normality):

$$\Lambda_{eq} = \frac{\kappa \times 1000}{N} = \frac{6 \times 10^{-3} \times 1000}{0.01} = \frac{6}{0.01} = 600 \text{ S cm}^2 \text{ eq}^{-1}$$

Approach & Analogy

Key trick for H₂SO₄: Since H₂SO₄ releases 2 H⁺ per molecule, when the question uses normality and asks for conductance, use *N* directly in the formula. Think of it as: each “unit” of acid (equivalent) contributes to conductance.

Answer

Option (2) $\Lambda_m = 600 \text{ S cm}^2 \text{ mol}^{-1}$

9 **Specific conductance of 0.1 M HNO₃ = $6.3 \times 10^{-2} \text{ ohm}^{-1} \text{ cm}^{-1}$. Molar conductance?**

Explanation

HNO₃ is a strong monobasic acid. $M = 0.1 \text{ mol/L}$

$$\Lambda_m = \frac{\kappa \times 1000}{C_M} = \frac{6.3 \times 10^{-2} \times 1000}{0.1} = \frac{63}{0.1} = 630 \text{ ohm}^{-1} \text{ cm}^2 \text{ mol}^{-1}$$

Answer

Option (1) $\Lambda_m = 630 \text{ ohm}^{-1} \text{ cm}^2 \text{ mol}^{-1}$

10 **Conductance of 0.01 N CH₃COOH = $4.5 \times 10^{-4} \text{ ohm}^{-1}$ in a tube: $l = 6 \text{ cm}$, $A = 36 \text{ cm}^2$. Molar conductivity?**

Explanation

Step 1: Find cell constant.

$$G^* = \frac{l}{A} = \frac{6}{36} = \frac{1}{6} \text{ cm}^{-1}$$

Step 2: Find κ from conductance G .

$$\kappa = G \times G^* = 4.5 \times 10^{-4} \times \frac{1}{6} = 7.5 \times 10^{-5} \text{ S cm}^{-1}$$

Step 3: CH₃COOH is monobasic, so $N = M = 0.01 \text{ M}$.

$$\Lambda_m = \frac{\kappa \times 1000}{C_M} = \frac{7.5 \times 10^{-5} \times 1000}{0.01} = \frac{0.075}{0.01} = 7.5 \text{ S cm}^2 \text{ mol}^{-1}$$

Approach & Analogy

Analogy: This question gives conductance (G) of the solution, not conductivity (κ). It's like knowing how fast water flows through a pipe (conductance) but not the pipe material quality (conductivity). You use the pipe shape (G^*) to find the material quality: $\kappa = G \times G^*$.

Answer

Option (1) $\Lambda_m = 7.5 \text{ S cm}^2 \text{ mol}^{-1}$

11 Column of 0.1 mol/L NaOH: diameter = 1 cm, length = 10 cm, resistance = $5 \times 10^3 \text{ ohm}$. Molar conductivity?

Explanation

Step 1: Find cross-sectional area of circular column.

$$A = \pi r^2 = \pi \left(\frac{1}{2}\right)^2 = \frac{\pi}{4} \text{ cm}^2 \approx 0.7854 \text{ cm}^2$$

Step 2: Cell constant.

$$G^* = \frac{l}{A} = \frac{10}{\pi/4} = \frac{40}{\pi} \text{ cm}^{-1}$$

Step 3: Conductivity.

$$\kappa = \frac{G^*}{R} = \frac{40/\pi}{5 \times 10^3} = \frac{40}{5000\pi} = \frac{8}{1000\pi} \text{ S cm}^{-1}$$

Step 4: Molar conductivity.

$$\Lambda_m = \frac{\kappa \times 1000}{C_M} = \frac{\frac{8}{1000\pi} \times 1000}{0.1} = \frac{8}{\pi \times 0.1} = \frac{80}{\pi} \approx \frac{80}{3.14159} \approx 25.48 \text{ S cm}^2 \text{ mol}^{-1}$$

Approach & Analogy

Key point: The cross-section is a *circle* (diameter given, not area directly). Always compute $A = \pi r^2$ when diameter is given. This is the only tricky step — after that, it's the same formula chain.

Answer

Option (4) $\Lambda_m = \frac{80}{\pi} \approx 25.48 \text{ S cm}^2 \text{ mol}^{-1}$

12 0.1 M solution, $R = 1 \text{ k}\Omega$, $l = 100 \text{ cm}$, $A = 1 \text{ cm}^2$. Find Λ_m .

Explanation

Step 1: Cell constant.

$$G^* = \frac{l}{A} = \frac{100}{1} = 100 \text{ cm}^{-1}$$

Step 2: Conductivity. ($R = 1000 \Omega$)

$$\kappa = \frac{G^*}{R} = \frac{100}{1000} = 0.1 \text{ S cm}^{-1}$$

Step 3: Molar conductivity.

$$\Lambda_m = \frac{\kappa \times 1000}{C_M} = \frac{0.1 \times 1000}{0.1} = 1000 \text{ S cm}^2 \text{ mol}^{-1}$$

Answer

Option (2) $\Lambda_m = 1000 \text{ S cm}^2 \text{ mol}^{-1}$

13 **0.1 M solution:** $R_1 = 100 \Omega$, $\kappa_1 = 1.29 \text{ S m}^{-1}$. **0.02 M same solution:** $R_2 = 520 \Omega$. Find Λ_m of 0.02 M.

Explanation

Step 1: Find cell constant from 0.1 M data.

$$\kappa_1 = 1.29 \text{ S m}^{-1} \Rightarrow G^* = \kappa_1 \times R_1 = 1.29 \times 100 = 129 \text{ m}^{-1}$$

Step 2: Find κ_2 for 0.02 M solution.

$$\kappa_2 = \frac{G^*}{R_2} = \frac{129}{520} = 0.2481 \text{ S m}^{-1}$$

Step 3: Molar conductivity (SI units). $C_2 = 0.02 \text{ mol/L} = 0.02 \times 1000 \text{ mol/m}^3 = 20 \text{ mol m}^{-3}$

$$\Lambda_m = \frac{\kappa_2}{C_2} = \frac{0.2481}{20} = 0.01240 \text{ S m}^2 \text{ mol}^{-1} = 124 \times 10^{-4} \text{ S m}^2 \text{ mol}^{-1}$$

Approach & Analogy

Strategy: Use the first solution as a “calibration” to find the cell constant, then apply it to the second. The cell doesn’t change — only the solution inside changes!

SI Unit reminder: $1 \text{ S m}^2 \text{ mol}^{-1} = 10^4 \text{ S cm}^2 \text{ mol}^{-1}$

Answer

Option (1) $\Lambda_m = 124 \times 10^{-4} \text{ S m}^2 \text{ mol}^{-1}$

14 **0.2 M electrolyte:** $R_1 = 50 \Omega$, $\kappa = 1.4 \text{ S m}^{-1}$. **0.5 M same electrolyte:** $R_2 = 280 \Omega$. Find Λ_m of 0.5 M.

Explanation

Step 1: Find cell constant from 0.2 M data.

$$G^* = \kappa \times R = 1.4 \times 50 = 70 \text{ m}^{-1}$$

Step 2: Find κ_2 for 0.5 M.

$$\kappa_2 = \frac{G^*}{R_2} = \frac{70}{280} = 0.25 \text{ S m}^{-1}$$

Step 3: Molar conductivity (SI). $C_2 = 0.5 \text{ mol/L} = 500 \text{ mol m}^{-3}$

$$\Lambda_m = \frac{\kappa_2}{C_2} = \frac{0.25}{500} = 5 \times 10^{-4} \text{ S m}^2 \text{ mol}^{-1}$$

Answer

Option (3) $\Lambda_m = 5 \times 10^{-4} \text{ S m}^2 \text{ mol}^{-1}$

15 **0.1 M monobasic acid, specific resistance = r ohm-cm. Molar conductivity?**

Explanation

Specific resistance (ρ) = r Ω -cm, so:

$$\kappa = \frac{1}{\rho} = \frac{1}{r} \text{ S cm}^{-1}$$

Molar conductivity ($C_M = 0.1 \text{ M}$):

$$\Lambda_m = \frac{\kappa \times 1000}{C_M} = \frac{(1/r) \times 1000}{0.1} = \frac{1000}{0.1r} = \frac{10^4}{r} \text{ S cm}^2 \text{ mol}^{-1}$$

Approach & Analogy

Remember: Specific resistance (ρ) and specific conductance (κ) are *reciprocals*: $\kappa = 1/\rho$. They're like two sides of the same coin — one describes obstruction, the other describes ease of flow.

Answer

Option (3) $\Lambda_m = \frac{10^4}{r} \text{ S cm}^2 \text{ mol}^{-1}$

16 **Resistivity = x for 0.1 N H₂SO₄. Find molar conductance Λ .**

Explanation

H₂SO₄ has n -factor = 2. So: $M = N/2 = 0.1/2 = 0.05$ mol/L
 $\kappa = 1/x$ S cm⁻¹

$$\Lambda_m = \frac{\kappa \times 1000}{M} = \frac{(1/x) \times 1000}{0.05} = \frac{1000}{0.05x} = \frac{20000}{x}$$

Matching with options: Option (2) gives $\frac{2 \times 1000}{x \times 0.1} = \frac{2000}{0.1x} = \frac{20000}{x}$ ✓

Approach & Analogy

Key: For H₂SO₄ (diprotic), $N = 0.1$ means $M = 0.05$. Always halve the normality to get molarity for H₂SO₄. The numerator factor of 2 in option (2) accounts for this.

Answer

Option (2) $\Lambda = \frac{2 \times 1000}{x \times 0.1} = \frac{20000}{x}$ S cm² mol⁻¹

TYPE-3 : Equivalent Conductance Calculations

Key Formula: Equivalent Conductance

$$\Lambda_{eq} = \frac{\kappa \times 1000}{N} \quad (\text{cgs: } \kappa \text{ in S cm}^{-1}, N \text{ in eq/L}) \quad G^* = \frac{\kappa}{G} \quad \text{Cell constant} = \frac{\text{Conductivity}}{\text{Conductance}}$$

17 Which relation is correct?

Explanation

Checking each option:

- (1) **WRONG** — $\Lambda_m = \kappa \times V$ (volume in mL containing 1 mol), **not** $\kappa \times C$.
- (2) **WRONG** — $\Lambda_{eq} = \kappa \times V$ (volume containing 1 equivalent). It's $\kappa \times V$, not κ/V .
- (3) **CORRECT** — Cell constant $G^* = l/A$ and $\kappa = G \times G^*$, so $G^* = \kappa/G = \text{Conductivity/Conductance}$. ✓
- (4) **WRONG** — Conductance = κ/G^* (not $\kappa \times G^*$).

Approach & Analogy

Analogy for Option (3): Conductivity (κ) is like "how good the road material is" and Conductance (G) is "how fast traffic flows in *this specific* road." The cell constant (road's shape = length/area) = material quality / traffic flow. A wider or shorter road has lower cell constant — it makes traffic easier *regardless* of material.

Answer

$$\text{Option (3)} \quad G^* = \frac{\kappa}{G} = \frac{\text{Conductivity}}{\text{Conductance}}$$

18 Specific conductance of 1 M H₂SO₄ = $26 \times 10^{-2} \text{ S cm}^{-1}$. Equivalent conductivity?

Explanation

For H₂SO₄: n -factor = 2, so normality $N = 1 \times 2 = 2 \text{ N}$

$$\Lambda_{eq} = \frac{\kappa \times 1000}{N} = \frac{26 \times 10^{-2} \times 1000}{2} = \frac{260}{2} = 130 \text{ S cm}^2 \text{ eq}^{-1} = 1.3 \times 10^2 \text{ S cm}^2 \text{ eq}^{-1}$$

Answer

$$\text{Option (1)} \quad \Lambda_{eq} = 1.3 \times 10^2 \text{ S cm}^2 \text{ eq}^{-1}$$

19 Specific conductance of 0.01 M KCl at 25°C = $0.0014 \text{ ohm}^{-1} \text{ cm}^{-1}$. Equivalent conductance?

Explanation

KCl is a 1-1 electrolyte: n -factor = 1, so $N = M = 0.01 \text{ N}$

$$\Lambda_{eq} = \frac{\kappa \times 1000}{N} = \frac{0.0014 \times 1000}{0.01} = \frac{1.4}{0.01} = 140 \text{ cm}^2 \text{ ohm}^{-1} \text{ eq}^{-1}$$

Answer

$$\text{Option (1)} \quad \Lambda_{eq} = 140 \text{ cm}^2 \text{ ohm}^{-1} \text{ eq}^{-1}$$

20 Specific conductivity of 0.5 N solution = $0.01286 \text{ ohm}^{-1} \text{ cm}^{-1}$. Equivalent conductance?

Explanation

$$\Lambda_{eq} = \frac{\kappa \times 1000}{N} = \frac{0.01286 \times 1000}{0.5} = \frac{12.86}{0.5} = 25.72 \approx 25.74 \text{ ohm}^{-1} \text{ cm}^2 \text{ eq}^{-1}$$

Answer

Option (3) $\Lambda_{eq} \approx 25.74 \text{ ohm}^{-1} \text{ cm}^2 \text{ eq}^{-1}$

21 Specific resistance of a $C \text{ g eq L}^{-1}$ solution is R . Find equivalent conductance.

Explanation

Specific conductance $\kappa = \frac{1}{R}$ (S cm^{-1} , since R is in ohm-cm)

$$\Lambda_{eq} = \frac{\kappa \times 1000}{C} = \frac{(1/R) \times 1000}{C} = \frac{1000}{RC}$$

Answer

Option (3) $\Lambda_{eq} = \frac{1000}{RC}$

22 1 N CH_3COOH : $R = 250 \Omega$, cell constant = 1.15 cm^{-1} . Equivalent conductance?

Explanation

Step 1: Find conductivity.

$$\kappa = \frac{G^*}{R} = \frac{1.15}{250} = 0.0046 \text{ ohm}^{-1} \text{ cm}^{-1}$$

Step 2: Equivalent conductance.

$$\Lambda_{eq} = \frac{\kappa \times 1000}{N} = \frac{0.0046 \times 1000}{1} = 4.6 \Omega^{-1} \text{ cm}^2 \text{ eq}^{-1}$$

Approach & Analogy

Note: CH_3COOH is a weak acid — its low equivalent conductance (4.6) compared to strong acids (hundreds) reflects poor ionization. Weak acid = fewer ions = lower conductance. This is why we measure Λ_{eq} experimentally rather than relying on full ionization!

Answer

Option (1) $\Lambda_{eq} = 4.6 \Omega^{-1} \text{ cm}^2 \text{ eq}^{-1}$

23 0.01 N electrolyte: $R = 210 \Omega$, cell constant = 0.66 cm^{-1} at 298 K. Equivalent conductance?

Explanation

Step 1: Conductivity.

$$\kappa = \frac{G^*}{R} = \frac{0.66}{210} = 3.143 \times 10^{-3} \text{ mho cm}^{-1}$$

Step 2: Equivalent conductance.

$$\Lambda_{eq} = \frac{\kappa \times 1000}{N} = \frac{3.143 \times 10^{-3} \times 1000}{0.01} = \frac{3.143}{0.01} = 314.3 \approx 314.28 \text{ mho cm}^2 \text{ eq}^{-1}$$

Answer

Option (1) $\Lambda_{eq} = 314.28 \text{ mho cm}^2 \text{ eq}^{-1}$

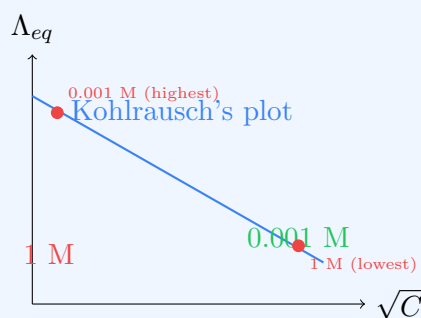
- 24 Which KCl solution has the *lowest* equivalent conductance? (1) 1 M (2) 0.1 M (3) 0.01 M (4) 0.001 M

Explanation

This is a conceptual question about Kohlrausch's Law:

$$\Lambda_{eq} = \Lambda_{eq}^{\circ} - K\sqrt{C}$$

As concentration **increases**, ionic interactions (inter-ionic forces) increase, slowing down the ions. Therefore, Λ_{eq} **decreases** with increasing concentration.



Highest concentration (1 M) has the **lowest** Λ_{eq} .

Approach & Analogy

Analogy: Imagine a crowded classroom vs. an empty one. In a crowded room (high concentration), students (ions) bump into each other more, slowing down. In an empty room (dilute), they move freely. More dilute = higher conductance!

Answer

Option (1): 1 M

Highest $C \Rightarrow$ most inter-ionic interactions \Rightarrow lowest Λ_{eq}

25 In $\Lambda = \kappa \times V$, if V is volume (cc) containing 1 equivalent, find V for $\frac{N}{10}$ solution.

Explanation

For a $\frac{N}{10} = 0.1$ N solution:

1 equivalent is present in $\frac{1}{N}$ litre = $\frac{1}{0.1} = 10$ litres

Converting to cubic centimetres (cc):

$$V = 10 \text{ L} \times 1000 \frac{\text{cc}}{\text{L}} = 10,000 \text{ cc}$$

Cross-check with formula:

$$\Lambda_{eq} = \kappa \times V = \kappa \times 10000 \text{ cc}$$

which matches $\Lambda_{eq} = \kappa \times 1000/N = \kappa \times 1000/0.1 = \kappa \times 10000 \checkmark$

Approach & Analogy

Quick Rule: Volume (in cc) containing 1 equivalent = $\frac{1000}{N}$.

For $N = 0.1$: $V = \frac{1000}{0.1} = 10000 \text{ cc}$.

Analogy: If you have a very dilute solution ($N/10$), you need to look in a bigger "tank" (10,000 cc) to find just 1 equivalent of ions — like finding a rare gem in a large lake vs. a puddle.

Answer

Option (4) $V = 10,000 \text{ c.c.}$

Key Formulas to Remember — DPP 8

Quantity	Formula
Cell Constant	$G^* = l/A = \kappa/G$
Conductivity	$\kappa = G^* \times G = G^*/R$
Molar Conductance	$\Lambda_m = \kappa \times 1000/C_M \text{ (cgs)}$
Equiv. Conductance	$\Lambda_{eq} = \kappa \times 1000/N \text{ (cgs)}$
Resistivity \leftrightarrow Conductivity	$\kappa = 1/\rho$
Volume rule	$V \text{ (cc)} = 1000/N \text{ for 1 equivalent}$