



QUICK DRILL · CBSE CLASS 12

Current Electricity

Physics · Chapter 3 · 15 MCQs · 20 minutes · PYQ-tagged with time budgets

DATE _____	TOTAL MARKS 15	DURATION 20 min	MARKING +1 / 0	TARGET ≥ 12/15
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OBJECTIVES

Reinforce the four core topics of Current Electricity via 15 PYQ-derived MCQs. Identify weak sub-topics via concept-node IDs (see answer key). Build per-question time budget habit.

INSTRUCTIONS

Attempt all 15. Time budget shown per Q (use it as pacing guide). Mark answers (A/B/C/D) in the margin. Answer key + explanations on the last page. **Don't peek — score yourself honestly.**

SECTION · QUICK DRILL

Q 1-15 · 20 MIN

- Q1.** Two resistors 3 Ohm and 6 Ohm are connected in parallel. The equivalent resistance is:
 (A) 9 Ohm (B) 4.5 Ohm
 (C) 2 Ohm (D) 0.5 Ohm
 PYQ 2019 · Delhi · 1 m · 30s
- Q2.** A cell of EMF 6 V and internal resistance 1 Ohm is connected to an external resistance of 2 Ohm. The current in the circuit is:
 (A) 1 A (B) 2 A
 (C) 3 A (D) 6 A
 PYQ 2020 · Outside Delhi · 1 m · 30s
- Q3.** Drift velocity of electrons in a metallic conductor is of the order of:
 (A) 10^{-4} m/s (B) 10^{-1} m/s
 (C) 10^4 m/s (D) 10^8 m/s
 PYQ 2018 · Delhi · 1 m · 30s
- Q4.** The Wheatstone bridge is most sensitive when all four resistances are:
 (A) Equal (B) Very different
 (C) Two pairs equal (D) Increasing geometrically
 PYQ 2021 · Outside Delhi · 1 m · 30s
- Q5.** Resistivity of a conductor depends on:
 (A) Length only (B) Area only
 (C) Temperature and material (D) Voltage applied
 PYQ 2019 · Delhi · 1 m · 30s
- Q6.** At null point in a potentiometer, the current through the unknown cell is:
 (A) Maximum (B) Half of total
 (C) Zero (D) Equal to potentiometer current
 PYQ 2022 · Delhi · 1 m · 30s
- Q7.** Two cells of EMF 2 V and 4 V (negligible internal resistance) are connected in series. Net EMF is:
 (A) 2 V (B) 3 V
 (C) 6 V (D) 8 V
 PYQ 2020 · Delhi · 1 m · 30s
- Q8.** If the length of a wire is doubled and its cross-section is halved, its new resistance becomes:
 (A) Same (B) Twice
 (C) Four times (D) Half
 PYQ 2018 · Outside Delhi · 1 m · 30s
- Q9.** Kirchhoff's junction rule is based on the conservation of:
 (A) Energy (B) Momentum
 (C) Charge (D) Mass
 PYQ 2023 · Delhi · 1 m · 30s
- Q10.** Kirchhoff's loop rule is based on the conservation of:
 (A) Charge (B) Mass
 (C) Energy (D) Momentum
 PYQ 2023 · Outside Delhi · 1 m · 30s

Q11. Power dissipated in a resistor R carrying current I is:

- (A) IR
(C) $I^2 R$

- (B) I/R
(D) I^2/R

PYQ 2019 · Delhi · 1m · 30s

Q12. A 12 V battery supplies 2 A to a circuit. The total resistance of the circuit is:

- (A) 6 Ohm
(C) 14 Ohm

- (B) 10 Ohm
(D) 24 Ohm

PYQ 2022 · Outside Delhi · 1m · 30s

Q13. A Wheatstone bridge has $P = 4 \text{ Ohm}$, $Q = 8 \text{ Ohm}$, $R = 5 \text{ Ohm}$. The value of S for balance is:

- (A) 2.5 Ohm
(C) 10 Ohm

- (B) 5 Ohm
(D) 20 Ohm

PYQ 2024 · Delhi · 1m · 30s

Q14. For an ohmic conductor at constant temperature, the V-I graph is:

- (A) A parabola
(C) An exponential curve

- (B) A straight line through origin
(D) A hyperbola

PYQ 2018 · Delhi · 1m · 30s

Q15. Mobility of a charge carrier is defined as:

- (A) $v_d \cdot E$
(C) E / v_d

- (B) v_d / E
(D) $1 / v_d$

PYQ 2023 · Delhi · 1m · 30s

ANSWER KEY & EXPLANATIONS

Q 1-15 · MARK YOUR SCORE

Q1. Answer: C

$1/R_{eq} = 1/3 + 1/6 = 2/6 + 1/6 = 3/6 = 1/2$, so $R_{eq} = 2 \text{ Ohm}$.

Q2. Answer: B

$I = \epsilon / (R+r) = 6 / (2+1) = 2 \text{ A}$.

Q3. Answer: A

Typical drift velocity in copper at 1 A is $\sim 10^{-4} \text{ m/s}$ — extremely small compared to thermal velocity ($\sim 10^5 \text{ m/s}$).

Q4. Answer: A

Sensitivity is maximum when all four arm resistances are nearly equal — galvanometer responds most strongly to small imbalances.

Q5. Answer: C

Resistivity ρ is a material property and varies with temperature: $\rho(T) = \rho_0 [1 + \alpha (T - T_0)]$. It does NOT depend on geometry.

Q6. Answer: C

Null point means no deflection in galvanometer $\Rightarrow$ zero current through the test cell. Hence the cell's terminal voltage equals its true EMF.

Q7. Answer: C

Series with same polarity: $\epsilon_{eq} = 2 + 4 = 6 \text{ V}$.

Q8. Answer: C

$R = \rho L/A$. New $R = \rho (2L)/(A/2) = 4 \rho L/A = 4R$. So four times the original.

Q9. Answer: C

KCL states sum of currents into a node = sum out — this is conservation of CHARGE (no charge accumulates at a node).

Q10. Answer: C

KVL states sum of EMFs = sum of IR drops around a loop — this is conservation of ENERGY per unit charge.

Q11. Answer: C

$P = VI = I^2 R$. Equivalent forms: V^2/R or VI .

Q12. Answer: A

$R = V/I = 12/2 = 6 \text{ Ohm}$.

Q13. Answer: C

$P/Q = R/S \Rightarrow 4/8 = 5/S \Rightarrow S = (5 \cdot 8)/4 = 10 \text{ Ohm}$.

Q14. Answer: B

Ohmic: V proportional to I with constant slope R. Straight line through origin. Non-ohmic conductors (diode, bulb) give curved V-I graphs.

Q15. Answer: B

Mobility $\mu = v_d / E$. Units: $\text{m}^2 \text{V}^{-1} \text{s}^{-1}$. Higher mobility means faster drift response to a field.