

## Chapter 12 – Electricity (30 Important Q&A)

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### Basic Concepts

**Q1. Define electric current.**

**Ans:** Flow of electric charge (electrons) through a conductor.

**Q2. Unit of current:**

**Ans:** Ampere (A)

**Q3. Define potential difference (voltage).**

**Ans:** Work done to move a unit charge between two points.

**Q4. Unit of potential difference:**

**Ans:** Volt (V)

**Q5. Define resistance.**

**Ans:** Opposition offered by a conductor to the flow of current.

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### Ohm's Law

**Q6. State Ohm's law:**

**Ans:** Current through a conductor is directly proportional to voltage across it, provided temperature remains constant.

**Q7. Ohm's law formula:**

**Ans:**  $V = I \times R$  (V = voltage, I = current, R = resistance)

**Q8. Unit of resistance:**

**Ans:** Ohm ( $\Omega$ )

**Q9. Factors affecting resistance:**

**Ans:** Material, length, area, temperature of conductor.

**Q10. Conductors and insulators:**

**Ans:** Conductors allow current (copper, aluminum), insulators do not (rubber, glass).

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### Series and Parallel Circuits

**Q11. Series circuit:**

**Ans:** Components connected one after another; same current flows through all.

**Q12. Parallel circuit:**

**Ans:** Components connected across same two points; voltage same across all branches.

**Q13. Total resistance in series:**

**Ans:**  $R_t = R_1 + R_2 + R_3 + \dots$

**Q14. Total resistance in parallel:**

**Ans:**  $1/R_t = 1/R_1 + 1/R_2 + 1/R_3 + \dots$

**Q15. Advantage of parallel circuit:**

**Ans:** Each device gets full voltage; independent operation.

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**Heating Effect of Current**

**Q16. Heating effect definition:**

**Ans:** Current through conductor produces heat due to resistance.

**Q17. Formula for heat produced:**

**Ans:**  $H = I^2 R t$  (H = heat, I = current, R = resistance, t = time)

**Q18. Applications of heating effect:**

**Ans:** Electric heater, fuse, electric bulb, toaster.

**Q19. Fuse purpose:**

**Ans:** Protects circuit from excessive current by melting.

**Q20. Material used in fuse:**

**Ans:** Tin-lead alloy

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**Electric Power**

**Q21. Electric power formula:**

**Ans:**  $P = VI = I^2 R = V^2/R$

**Q22. Unit of power:**

**Ans:** Watt (W)

**Q23. Energy consumed formula:**

**Ans:**  $E = Pt$  (P = power, t = time)

**Q24. Unit of energy consumed:**

**Ans:** Kilowatt-hour (kWh)

**Q25. Example:**

**Ans:** 1 kW appliance running for 1 hour consumes 1 kWh.

## **Electrostatics & Safety**

**Q26. Define electrostatics:**

**Ans:** Study of charges at rest.

**Q27. Conductors in electrostatics:**

**Ans:** Allow charges to move freely (metals).

**Q28. Insulators in electrostatics:**

**Ans:** Do not allow free movement of charges (rubber, glass).

**Q29. Earthing purpose:**

**Ans:** Provides safe path for excess current to the ground.

**Q30. Safety devices in electrical circuits:**

**Ans:** Fuse, circuit breaker, earthing, MCB.

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