

Class 10 Physics

Concept Revision • Formulae • Solved Numericals

A practical revision companion

Learn the concept, understand the method, practise with guided examples, and revise with confidence.

Concept Clarity • Guided Practice • Exam Confidence

01 Electricity

Core idea

Electric current is the rate of flow of charge. Potential difference is work done per unit charge; resistance opposes current.

Key formulas / rules

$I=Q/t$; $V=W/Q$; $V=IR$; $P=VI=I^2R=V^2/R$; $E=Pt$.

Guided solved examples

Example 1. A $6\ \Omega$ resistor is connected to 12 V. Find current.

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

Example 2. Find power for the same resistor.

Solution. $P=VI=12\times 2=24\text{ W}$.

Common mistakes

Do not mix power and energy units.

Exam tip

Write the given values with units before selecting a formula.

Practice

1. A $10\ \Omega$ resistor carries 2 A. Find voltage.
2. A device uses 100 W for 3 h. Find energy in Wh.
3. Two resistors $4\ \Omega$ and $6\ \Omega$ are in series. Find total resistance.

02 Light

Core idea

Reflection changes the direction of light at a surface; refraction changes direction when light enters another medium.

Key formulas / rules

Mirror relation: $1/f=1/v+1/u$. Lens relation: $1/f=1/v-1/u$, with a consistent sign convention. $n=c/v$.

Guided solved examples

Example 1. State the law of reflection.

Solution. Angle of incidence equals angle of reflection, measured from the normal.

Example 2. Light travels at $2\times 10^8\text{ m/s}$ in a medium. Estimate refractive index.

Solution. $n=c/v\approx 3\times 10^8/(2\times 10^8)=1.5$.

Common mistakes

Keep the sign convention consistent throughout a numerical.

Exam tip

Draw a principal ray diagram before solving lens/mirror problems.

Practice

1. State two laws of reflection.
2. A medium has refractive index 1.5. Compare its light speed with vacuum.
3. Explain why a pencil appears displaced in water.

03 Human Eye

Core idea

The eye focuses light on the retina. Accommodation changes the effective focal length of the eye lens.

Key formulas / rules

Myopia is corrected using a suitable concave lens; hypermetropia using a suitable convex lens.

Guided solved examples

Example 1. What is accommodation?

Solution. The ability of the eye lens system to adjust its focal length so objects at different distances are focused on the retina.

Example 2. Which lens corrects myopia?

Solution. A concave lens is used to diverge incoming rays appropriately before they enter the eye.

Common mistakes

Do not confuse the corrective lens types.

Exam tip

Explain defects using ray paths rather than memorised names only.

Practice

1. Differentiate myopia and hypermetropia.
2. Explain accommodation in your own words.
3. Why is the retina important?

04 Magnetic Effects

Core idea

An electric current produces a magnetic field. Magnetic fields exert forces on suitable current-carrying conductors and magnets.

Key formulas / rules

Right-hand thumb rule gives field direction around a straight current-carrying conductor.
Electromagnetic induction occurs when magnetic flux through a circuit changes.

Guided solved examples

Example 1. What happens around a straight current-carrying wire?

Solution. A magnetic field forms in concentric circles around the wire.

Example 2. Name one use of electromagnetic induction.

Solution. Generators use electromagnetic induction to produce electrical energy from mechanical motion.

Common mistakes
Always state the direction rule carefully.
Exam tip
Use a simple labelled sketch to visualise field direction.

Practice

1. State the right-hand thumb rule.
2. Give one application of an electromagnet.
3. Explain electromagnetic induction.

05 Sources of Energy

Core idea

An energy source should be evaluated for availability, environmental impact, reliability and practical use.

Key formulas / rules
Renewable sources replenish naturally; non-renewable sources are finite. Efficiency and environmental effects matter in comparing sources.

Guided solved examples

Example 1. Give two renewable sources.

Solution. Solar and wind are renewable sources.

Example 2. Why is energy efficiency important?

Solution. Higher efficiency means more useful output from the same input, reducing resource use and losses.

Common mistakes
Compare sources using the same criteria.
Exam tip
Use a small comparison table in long answers.

Practice

1. Compare solar and fossil-fuel energy on two criteria.
2. Give two desirable characteristics of an energy source.
3. Explain one environmental concern associated with burning fossil fuels.

Rapid Revision Sheet

Electricity
$I=Q/t$; $V=IR$; $P=VI$; $E=Pt$. Keep voltage, current, resistance and power distinct.
Light
Reflection and refraction; use consistent sign conventions and ray diagrams.
Eye
Accommodation; myopia → concave lens; hypermetropia → convex lens.
Magnetism
Current creates magnetic field; use right-hand thumb rule; induction needs changing magnetic flux.
Energy
Compare sources by renewability, efficiency, reliability and environmental impact.

Mixed Practice Test

1. A $12\ \Omega$ resistor is connected to 24 V. Find current and power.
2. A device of 60 W runs for 5 h. Find energy in Wh.
3. State the law of reflection.
4. A medium has $n=1.25$. Find its approximate light speed if $c=3\times 10^8\text{ m/s}$.
5. Which lens corrects myopia?
6. State one application of electromagnetic induction.

Answer Key

1. 2 A; 48 W.
2. 300 Wh.
3. Angle of incidence equals angle of reflection.
4. 2.4×10^8 m/s.
5. Concave lens.
6. Electric generator.

Ready to Learn with Clarity?

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