CBSE CLASS X

Science (086)

QUESTION PAPER

AI-generated question paper

Code: 510NHD **Questions: 17** **Maximum Marks: 30** **Generated: 2026-06-25 17:50**

SELECTIONS USED

Subject	Science
Lessons	12 Magnetic Effects of Electric Current
Level of understanding	Initial understanding
Question selection	Curated chapter coverage (~3 questions per section)
Model	claude-sonnet-4-6

Composition — Difficulty: 8 straightforward · 9 medium | Types: 8 Very short · 8 Short · 1 MCQ

Q1. straightforward · initial-understanding · § Introduction **[1]**

When a current-carrying wire is placed near a compass needle, the needle gets deflected. What does this observation tell us about electric current?

◆ **Magnetic Effects of Electric Current**

Q2. straightforward · initial-understanding · § 12.1 MAGNETIC FIELD AND FIELD LINES **[1]**

Define magnetic field. State its SI unit.

◆ **Magnetic Effects of Electric Current**

Q3. medium · initial-understanding · § 12.1 MAGNETIC FIELD AND FIELD LINES **[1]**

Two magnetic field lines can never cross each other. Why not?

◆ **Magnetic Effects of Electric Current**

Q4. straightforward · initial-understanding · § 12.2 MAGNETIC FIELD DUE TO A CURRENT-CARRYING CONDUCTOR **[1]**

State the right-hand thumb rule for finding the direction of the magnetic field around a straight current-carrying conductor.

◆ **Magnetic Effects of Electric Current**

Q5. straightforward · initial-understanding · § 12.2.1 Magnetic Field due to a Current through a Straight Conductor **[1]**

What is the shape of the magnetic field lines formed around a long straight current-carrying conductor?

◆ **Magnetic Effects of Electric Current**

Q6. medium · initial-understanding · § 12.2.1 Magnetic Field due to a Current through a Straight Conductor **[2]**

A student moves a compass needle closer to a straight current-carrying wire (without changing the current). How does the deflection of the compass needle change, and what does this tell us about the magnetic field?

◆ **Magnetic Effects of Electric Current**

Q7. medium | initial-understanding | § 12.2.1 Magnetic Field due to a Current through a Straight Conductor **[3]**

A vertical straight wire carries current flowing upward. What is the direction of the magnetic field lines at a point to the east of the wire (as seen from above)? State the rule you used and explain how you arrived at your answer.

◆ **Magnetic Effects of Electric Current**

Q8. straightforward | initial-understanding | § 12.2.2 Right-Hand Thumb Rule **[1]**

A vertical wire carries current flowing straight upward. Using the right-hand thumb rule, what is the direction of the magnetic field lines around this wire — clockwise or anticlockwise — when viewed from above?

◆ **Magnetic Effects of Electric Current**

Q9. medium | initial-understanding | § 12.2.3 Magnetic Field due to a Current through a Circular Loop **[2]**

A circular coil has 50 turns of wire. How does the magnetic field at its centre compare to that produced by a single-turn coil carrying the same current? Give a reason for your answer.

◆ **Magnetic Effects of Electric Current**

Q10. medium | initial-understanding | § 12.2.4 Magnetic Field due to a Current in a Solenoid **[3]**

Draw or describe the magnetic field pattern produced around a current-carrying solenoid. What do the two ends of the solenoid behave like, and how does the field pattern help you identify them?

◆ **Magnetic Effects of Electric Current**

Q11. straightforward | initial-understanding | § 12.3 FORCE ON A CURRENT-CARRYING CONDUCTOR IN A MAGNETIC FIELD **[1]**

A current-carrying conductor is placed in a magnetic field. Under what condition is the force on the conductor the largest?

◆ **Magnetic Effects of Electric Current**

Q12. straightforward | initial-understanding | § 12.3 FORCE ON A CURRENT-CARRYING CONDUCTOR IN A MAGNETIC FIELD **[3]**

State Fleming's left-hand rule. Name the physical quantities represented by the thumb and the two fingers used in this rule.

◆ **Magnetic Effects of Electric Current**

Q13. medium | initial-understanding | § 12.3 FORCE ON A CURRENT-CARRYING CONDUCTOR IN A MAGNETIC FIELD **[2]**

An aluminium rod is suspended horizontally between the poles of a horseshoe magnet with the magnetic field directed vertically upward. When current is passed through the rod, it deflects to the left. What will happen to the direction of deflection if (i) the direction of current is reversed, and (ii) the poles of the magnet are interchanged (so the field is now directed downward)?

◆ **Magnetic Effects of Electric Current**

Q14. medium | initial-understanding | § 12.3 FORCE ON A CURRENT-CARRYING CONDUCTOR IN A MAGNETIC FIELD **[1]**

A positive charge moves vertically downward and enters a magnetic field directed horizontally from south to north. Using Fleming's left-hand rule, what is the direction of force on the charge?
(a) East
(b) West
(c) Vertically upward
(d) Vertically downward

A East
B West
C Vertically upward
D Vertically downward

◆ **Magnetic Effects of Electric Current**

Q15. straightforward | initial-understanding | § 12.4 DOMESTIC ELECTRIC CIRCUITS **[1]**

Name the colours of insulation used for the live wire, the neutral wire, and the earth wire in a household electric circuit in India.

◆ **Magnetic Effects of Electric Current**

Q16. medium | initial-understanding | § 12.4 DOMESTIC ELECTRIC CIRCUITS **[3]**

What is the purpose of an earth wire in a domestic circuit? Why is it essential for appliances like electric irons or refrigerators that have metallic bodies?

◆ **Magnetic Effects of Electric Current**

Q17. medium | initial-understanding | § 12.4 DOMESTIC ELECTRIC CIRCUITS **[3]**

What is short-circuiting in a domestic electric circuit, and how does an electric fuse protect the circuit when it occurs?

◆ **Magnetic Effects of Electric Current**

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