

CBSE CLASS X
Science (086)QUESTION PAPER
AI-generated question paper

Code: LY8TBK

Questions: 24

Maximum Marks: 42

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SELECTIONS USED

Subject	Science
Lessons	11 Electricity
Level of understanding	Initial understanding
Question selection	Curated chapter coverage (~3 questions per section)
Model	claude-sonnet-4-6

Composition — Difficulty: 15 straightforward · 8 medium · 1 deep | Types: 13 Short · 10 Very short · 1 MCQ

Q1. straightforward initial-understanding § Chapter Introduction [1]

What is an electric circuit?

◆ Electricity

Q2. straightforward initial-understanding § 11.1 ELECTRIC CURRENT AND CIRCUIT [1]

Define electric current. State its SI unit.

◆ Electricity

Q3. medium initial-understanding § 11.1 ELECTRIC CURRENT AND CIRCUIT [2]

In a metallic wire, electrons are the actual charge carriers, yet the conventional direction of electric current is taken as opposite to the direction of electron flow. Why?

◆ Electricity

Q4. straightforward initial-understanding § 11.2 ELECTRIC POTENTIAL AND POTENTIAL DIFFERENCE [2]

What is electric potential difference? State its SI unit and define it.

◆ Electricity

Q5. straightforward initial-understanding § 11.4 OHM'S LAW [1]

State Ohm's law.

◆ Electricity

Q6. straightforward initial-understanding § 11.4 OHM'S LAW [1]

In an electric circuit, the potential difference across a resistor is 12 V and the current through it is 3 A. What is the resistance of the resistor?

◆ Electricity

Q7. medium initial-understanding § 11.4 OHM'S LAW [2]

The resistance of a conductor is kept constant. If the potential difference across it is doubled, what happens to the current through it? Justify your answer.

◆ Electricity

Q8. medium initial-understanding § 11.4 OHM'S LAW [3]

When the potential difference V across a conductor is plotted against the current I through it, a straight line passing through the origin is obtained. What does the slope of this V – I graph represent?

◆ Electricity

Q9. straightforward initial-understanding § 11.5 FACTORS ON WHICH THE RESISTANCE OF A CONDUCTOR DEPENDS [1]

State the factors on which the resistance of a uniform metallic conductor depends.

◆ Electricity

Q10. straightforward initial-understanding § 11.5 FACTORS ON WHICH THE RESISTANCE OF A CONDUCTOR DEPENDS [2]

A nichrome wire of length l has a resistance R . It is replaced by another nichrome wire of the same cross-sectional area but of length $2l$. What will be the new resistance? Give a reason for your answer.

◆ Electricity

Q11. medium initial-understanding § 11.5 FACTORS ON WHICH THE RESISTANCE OF A CONDUCTOR DEPENDS [2]

Two wires are made of the same material and have the same length, but one is thicker than the other. Which wire has greater resistance, and why?

◆ Electricity

Q12. deep initial-understanding § 11.5 FACTORS ON WHICH THE RESISTANCE OF A CONDUCTOR DEPENDS [3]

A student needs a wire with very high resistance for use in an electric heating device. She has two wires of identical dimensions — one made of copper and one made of nichrome. (a) Which wire should she choose, and why? (b) State one property of nichrome, other than high resistivity, that makes it suitable for use in heating devices.

◆ Electricity

Q13. medium initial-understanding § 11.6 RESISTANCE OF A SYSTEM OF RESISTORS [2]

Three resistors of $4\ \Omega$, $6\ \Omega$, and $12\ \Omega$ are connected in parallel. Explain why the equivalent resistance of this combination is less than $4\ \Omega$.

◆ Electricity

Q14. straightforward initial-understanding § 11.6.1 Resistors in Series [2]

An ammeter is connected at three different positions in a series circuit with three resistors: before the first resistor, between the first and second, and after the third. What would the three ammeter readings be? What conclusion can you draw about current in a series combination?

◆ Electricity

Q15. straightforward initial-understanding § 11.6.1 Resistors in Series [1]

Three resistors of $4\ \Omega$, $6\ \Omega$, and $10\ \Omega$ are connected in series. What is the equivalent resistance of the combination?

◆ Electricity

Q16. medium initial-understanding § 11.6.1 Resistors in Series [3]

A student connects a $2\ \Omega$ and an $8\ \Omega$ resistor in series to a 10 V battery. (a) Calculate the total resistance of the circuit. (b) Find the current flowing through the circuit. (c) Find the potential difference across the $8\ \Omega$ resistor.

◆ Electricity

Q17. straightforward initial-understanding § 11.6.2 Resistors in Parallel [1]

[very_short_answer] Three resistors are connected in parallel across a battery of potential difference V. What is the potential difference across each individual resistor?

◆ Electricity

Q18. straightforward initial-understanding § 11.6.2 Resistors in Parallel [1]

Three resistors of resistances R_1 , R_2 , and R_3 are connected in parallel. Write the expression for their equivalent resistance R_p .

◆ Electricity

Q19. medium initial-understanding § 11.6.2 Resistors in Parallel [3]

[short_answer] Three resistors carrying currents I_1 , I_2 , and I_3 are connected in parallel across a battery. Write the expression relating the total current I drawn from the battery to I_1 , I_2 , and I_3 .

◆ Electricity

Q20. medium initial-understanding § 11.6.2 Resistors in Parallel [2]

State TWO practical advantages of connecting electrical appliances in parallel rather than in series in a domestic circuit.

◆ Electricity

Q21. straightforward initial-understanding § 11.7 HEATING EFFECT OF ELECTRIC CURRENT [3]

State Joule's law of heating. Write the mathematical expression for heat produced in a resistor and explain what each symbol represents.

◆ Electricity

Q22. straightforward initial-understanding § 11.7 HEATING EFFECT OF ELECTRIC CURRENT [1]

Tungsten is preferred over most other metals for making the filament of an electric bulb. Which two properties of tungsten make it most suitable for this purpose?

◆ Electricity

Q23. straightforward initial-understanding § 11.7.1 Practical Applications of Heating Effect of Electric Current [1]

Why is tungsten preferred over other metals for making the filaments of electric bulbs?

◆ Electricity

Q24. straightforward initial-understanding § 11.8 ELECTRIC POWER

[1]

Which of the following expressions correctly represents the electric power consumed in a circuit?

(A) $P = VI$

(B) $P = V^2/R$

(C) $P = I^2R$

(D) $P = IR^2$

A VI

B I^2R

C IR^2

D V^2/R

◆ Electricity

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