

4. Electricity and magnetism

Starter Quiz · 课前小测

IGCSE Physics

Name: _____ Score: _____

1. Two north poles are brought close together. They:

- ☐ repel (push apart)
- ☐ attract (pull together)
- ☐ do nothing
- ☐ swap to become south poles

2. Two negative charges attract each other.

- ☐ True
- ☐ False

3. A charge of 30 C flows past a point in 10 s. What is the current, in A?

_____ A

4. A component has 12 V across it and a current of 3.0 A through it. What is its resistance, in Ω ?

_____ Ω

5. What happens to the resistance of a thermistor as it gets hotter?

- ☐ it falls
- ☐ it rises
- ☐ it stays the same
- ☐ it becomes infinite

6. Select **all** of these that are electrical hazards.

- ☐ damaged insulation (bare wires)
- ☐ overloading a socket
- ☐ damp conditions
- ☐ switching a lamp off

Tick every correct option.

7. The magnetic field of a solenoid (a long coil carrying current) looks like the field of:

- ☐ a bar magnet
- ☐ a single point charge
- ☐ no field at all
- ☐ a flat sheet

8. How can you induce a current in a coil with a magnet?

- ☐ move the magnet in or out of the coil
- ☐ hold the magnet still inside the coil
- ☐ warm the magnet up
- ☐ paint the coil

9. A transformer works with a steady direct current (d.c.).

- ☐ True
- ☐ False

10. Which of these is a magnetic material (attracted by a magnet)?

- ☐ iron
- ☐ copper
- ☐ plastic
- ☐ wood

1. **repel (push apart)**

Like poles repel. Only different poles (N and S) attract.

2. **False**

Like charges repel; only different charges (+ and −) attract.

3. **3 A**

$$I = \frac{Q}{t} = \frac{30}{10} = 3.0 \text{ A.}$$

4. **4 Ω**

$$R = \frac{V}{I} = \frac{12}{3.0} = 4.0 \text{ Ω.}$$

5. **it falls**

A thermistor's resistance falls as temperature rises — useful in temperature-sensing circuits.

6. **damaged insulation (bare wires); overloading a socket; damp conditions**

Bare wires, overloading and damp all raise the risk of shock or fire. Switching a lamp off is normal, safe use.

7. **a bar magnet**

A solenoid produces a bar-magnet-like field, with a north pole at one end and a south at the other.

8. **move the magnet in or out of the coil**

A current is induced only when the field through the coil is changing — for example by moving the magnet.

9. **False**

A transformer needs a changing magnetic field, so it works on a.c. only. A steady d.c. makes no change and induces nothing.

10. **iron**

Iron (also steel, cobalt, nickel) is magnetic. Copper, plastic and wood are not.