GET BETTER AT PHYSICS · MARK SCHEME

Thermistors & LDRs: tiered multiple choice

Edexcel IAL Physics · Unit 2 (WPH12) · Specification points 79–80 · 5 questions · 5 marks

1 mark per correct letter | Worked reasoning for every question

How students did = from Pearson examiner reports, where available

Answer key

Q1	Q2	Q3	Q4	Q5
C	A	B	C	B

Easy

Questions 1–4

1 **C**

LDR in brighter light · Edexcel IAL January 2024 · Unit 2 · Q2

When more light falls on an LDR, photons give energy to electrons and release more of them as conduction electrons. With more charge carriers, the resistance of the LDR decreases.

How students did: 79% of students got this right in January 2024.

2 **A**

Cooling a thermistor in a circuit · Edexcel IAL January 2025 · Unit 2 · Q5

As the thermistor cools, fewer electrons have enough energy to become conduction electrons. Fewer charge carriers means a higher resistance, so the current (the ammeter reading) decreases.

3 **B**

Heating a thermistor and a metal wire · Edexcel IAL June 2024 · Unit 2 · Q1

In an NTC thermistor, heating releases many more conduction electrons, so its resistance decreases. In a metal wire, the number of conduction electrons hardly changes but the ions vibrate more, so its resistance increases.

4 **C**

Conduction electrons in an LDR · Edexcel IAL June 2022 · Unit 2 · Q9

Photons of light give energy to electrons in the LDR, releasing them so they can conduct. Brighter light means more photons and so more conduction electrons.

> **Watch out:** The electrons stay inside the material; this is not the photoelectric effect, which releases electrons from a surface.

Medium

Question 5

5 **B**

Why an NTC thermistor's resistance falls · Edexcel IAL January 2022 · Unit 2 · Q4

As the temperature rises, more electrons gain enough energy to become conduction electrons. This increase in charge carriers outweighs the extra collisions caused by larger lattice vibrations, so the resistance falls.

> **Watch out:** The ions do vibrate more (D), but that would increase resistance. The key effect is the extra conduction electrons.

How students did: Examiners listed this among the least successful multiple-choice questions on the January 2022 paper. Most wrong answers were C or D.

End of mark scheme. Answers from Pearson's published mark schemes; explanations written for this pack. Pearson Edexcel material is © Pearson Education Ltd. More free packs and 1-to-1 tuition: **www.getbetteratphysics.co.uk**

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