GET BETTER AT PHYSICS · MARK SCHEME

Transformers & Power Transmission: tiered multiple choice

AQA A-level Physics · 7408 · Specification 3.7.5.6 · 6 questions · 6 marks

1 mark per correct letter | Worked reasoning for every question | **How students did** = from AQA examiner reports, where available

Answer key

Q1	Q2	Q3	Q4	Q5	Q6
A	A	C	B	A	C

Easy

Questions 1–3

1 **A**

Primary current and secondary voltage · AQA June 2018 · A-level Paper 2 · Q28

V_s = 240 × 175 / 7000 = 6.0 V. Output power = 6.0 × 8.0 = 48 W. Input power = 48 ÷ 0.80 = 60 W, so I_p = 60 ÷ 240 = 0.25 A = 250 mA.

Watch out: 160 mA (B) uses 48 W × 0.80 instead of dividing by the efficiency.

How students did: 57.5% of students got this right in June 2018.

2 **A**

Best way to improve transmission efficiency · AQA June 2024 · A-level Paper 2 · Q15

Power loss = I^2R. Doubling the transmission voltage halves the current for the same power, which cuts the loss to a quarter. Halving the resistivity only halves the loss.

Watch out: Doubling the current (B) or using fewer wires (D) makes the losses larger.

3 **C**

Primary current with 90% efficiency · AQA June 2023 · A-level Paper 2 · Q27

Output power = 3.00 × 12.0 = 36 W. Input = 36 ÷ 0.90 = 40 W. I_p = 40 ÷ 230 = 0.174 A.

Watch out: 0.141 A (A) multiplies by 0.90 instead of dividing.

Medium

Questions 4–6

4 **B**

What increases a transformer's efficiency? · AQA June 2024 · A-level Paper 2 · Q12

Eddy-current and hysteresis losses in the core grow with the frequency of the ac, so lowering the frequency reduces these losses and raises the efficiency.

Watch out: Thicker laminations (A) increase eddy currents, thinner wire (C) increases resistance, and moving the coils apart (D) increases flux leakage.

How students did: Fewer than 35% of students got this right in June 2024, and the correct answer was not the most popular choice.

5 **A**

Efficiency using peak values · AQA June 2025 · A-level Paper 2 · Q23

Mean input power = $V_{rms} \times I_{rms}$ = $(50/\sqrt{2})(5.0/\sqrt{2})$ = 125 W. Efficiency = 100 ÷ 125 = 80%.

Watch out: Using peak values directly gives 250 W and 40% (C). Convert to rms first.

How students did: Around a third of students got this right in June 2025, and a wrong answer was the most common choice.

6 **C**

Peak power in a lamp on a transformer · AQA June 2017 · A-level Paper 2 · Q25

$V_{s(rms)}$ = 230 × 130 / 2500 = 12.0 V, so the peak voltage is 12.0 × √2 = 16.9 V. Peak power = V_0^2 / R = 16.9^2 ÷ 6.0 = 48 W.

> **Watch out:** 24 W (B) is the mean power. The peak power is twice the mean power.

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

GET BETTER AT PHYSICS · WHAT NEXT?

Got some of these wrong?

Good. The questions you got wrong show you exactly what to work on next. The quickest way to fix them is to work through them with someone who marks these papers.

Book a free 15-minute call

Tell me which questions caught you out. We'll talk about what's going wrong and whether 1-to-1 or small-group tuition would help. There's no obligation.

Book your free call

calendly.com/getbetteratphysics/freechat

Scan to book

Current AQA examiner
I know what the mark schemes reward and where marks are lost.

Matched to your exam board
Sessions follow your specification and the topics you find hardest.

Pay per session
No block booking. 1-to-1 or small groups of up to 4.

More free packs

Tiered past-paper questions with full mark schemes, sorted by topic.
getbetteratphysics.co.uk/free-revision-packs

Masterclasses are coming

Want to hear first? Email **helpme@getbetteratphysics.co.uk** and I'll let you know when dates are announced.

Parents: I use these packs in my own tutoring sessions. Tuition options and prices:
getbetteratphysics.co.uk/tuitionpricing