FREE REVISION PACK

Transformers & Power Transmission

AQA A-level Physics · 7408 · Specification 3.7.5.6

Easy | Medium | Multiple choice · past-paper questions

6	6	≈ 10 min
QUESTIONS	TOTAL MARKS	SUGGESTED TIME*

Contents

Q	LEVEL	FOCUS	SOURCE	MARKS
1	Easy	Primary current and secondary voltage	AQA June 2018 · A-level Paper 2 · Q28	1 mark
2	Easy	Best way to improve transmission efficiency	AQA June 2024 · A-level Paper 2 · Q15	1 mark
3	Easy	Primary current with 90% efficiency	AQA June 2023 · A-level Paper 2 · Q27	1 mark
4	Medium	What increases a transformer's efficiency?	AQA June 2024 · A-level Paper 2 · Q12	1 mark
5	Medium	Efficiency using peak values	AQA June 2025 · A-level Paper 2 · Q23	1 mark
6	Medium	Peak power in a lamp on a transformer	AQA June 2017 · A-level Paper 2 · Q25	1 mark

Key ideas to have ready

- Transformer turns ratio: $V_s / V_p = N_s / N_p$.
- Efficiency = output power ÷ input power = $I_sV_s / (I_pV_p)$. For an ideal transformer $I_sV_s = I_pV_p$.
- Losses come from eddy currents (reduced by a laminated core), resistance of the coils (thick copper wire) and flux leakage (coils wound close together on the same core).
- Transmission: power lost in cables = I^2R. Transmitting at high voltage means a low current, so much smaller losses.

How to use this pack

1. The questions are grouped into levels (Easy and Medium). Work through them in order, and check your answers at the end of each level before moving on.
2. Every question is multiple choice with one correct answer. Write down your working anyway; that is how you find mistakes.
3. The separate mark scheme uses the same numbers and explains every answer.

Levels are based on how students did in AQA's examiner reports where that information exists, plus our own difficulty rating. *About 1.5 minutes per question.

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Easy

Definitions and one-step ideas. Most students get these right.

Questions 1–3

Only **one** answer per question is allowed. For each question, completely fill in the circle alongside the appropriate answer.

AQA June 2018 · A-level Paper 2 · Q28

1 A transformer has an efficiency of 80%
It has 7000 turns on its primary coil and 175 turns on its secondary coil. When the primary of the transformer is connected to a 240 V ac supply, the secondary current is 8.0 A

What are the primary current and secondary voltage?

[1 mark]

	Primary current / mA	Secondary voltage / V	
A	250	6.0	⬭
B	160	6.0	⬭
C	250	9600	⬭
D	160	9600	⬭

AQA June 2024 · A-level Paper 2 · Q15

2 A transmission cable consists of many strands of wire. Electrical energy is transmitted along the cable at a frequency of 50 Hz.

Which change gives the largest increase in the efficiency of the electrical energy transfer along the cable?

[1 mark]

A doubling the transmission voltage of the cable ⬭

B doubling the current in the cable ⬭

C halving the resistivity of the material of the wires ⬭

D halving the number of wires in the cable ⬭

AQA June 2023 · A-level Paper 2 · Q27

3 A transformer for use in a 230 V ac supply is 90% efficient.
The transformer provides a current of 3.00 A at 12.0 V.

What is the current in the primary coil?

[1 mark]

A 0.141 A ⬭

B 0.156 A ⬭

C 0.174 A ⬭

D 5.75 A ⬭

Medium

Two or three steps. Roughly a third to a half of students get these right.

Questions 4–6

AQA June 2024 · A-level Paper 2 · Q12

4 Which change will increase the efficiency of a transformer?

[1 mark]

A increasing the thickness of the iron layers in the laminated core ⬭

B decreasing the frequency of the ac input voltage ⬭

C decreasing the diameter of the copper wire in the primary coil ⬭

D increasing the distance between the primary coil and the secondary coil ⬭

AQA June 2025 · A-level Paper 2 · Q23

5 A transformer is used to connect an ac power supply to a $100\ \text{W}$ filament lamp.

When the lamp is operating at its rated power, the power supply has a peak potential difference of $50\ \text{V}$ and supplies a peak current of $5.0\ \text{A}$.

What is the efficiency of the transformer?

[1 mark]

A 80% ⬭

B 57% ⬭

C 40% ⬭

D 28% ⬭

AQA June 2017 · A-level Paper 2 · Q25

6 A mains transformer has a primary coil of 2500 turns and a secondary coil of 130 turns.
The primary coil is connected to a mains supply where V_{rms} is $230\ \text{V}$.
The secondary coil is connected to a lamp of resistance $6.0\ \Omega$.
The transformer is 100% efficient.

What is the peak power dissipated in the lamp?

[1 mark]

A $12\ \text{W}$ ⬭

B $24\ \text{W}$ ⬭

C $48\ \text{W}$ ⬭

D $96\ \text{W}$ ⬭

End of questions. Check your answers with the matching mark scheme. More free packs and 1-to-1 tuition:
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