

11.4 Electric Power

Name: _____ Class: _____ Date: _____

Total: 12 marks

KEY WORDS electric power 电功率 • resistance 电阻

Objective

Build the skills to answer exam questions on **electric power**.

You must be able to:

- calculate **electric power** 电功率 delivered to a device, $P = IV$
- rewrite power for a resistor as $P = I^2R = \frac{V^2}{R}$
- relate power to the **energy** transferred over time, $E = Pt$

1 Worked examples

Study these first. Each one shows the method for a question type used later.

■ Power

$P = IV$, in watts. For a resistor, using $V = IR$ gives two more forms:

$$P = I^2R = \frac{V^2}{R}.$$

■ Energy

$E = Pt$ — power multiplied by time.

■ Example

A device drawing 2.0 A at 12 V: $P = 24$ W.

2 Practice

2.1 A device draws 3.0 A at 12 V. Find the power.

[2]

2.2 A $6.0\ \Omega$ resistor carries $2.0\ \text{A}$. Find the power dissipated. [2]

2.3 A $60\ \text{W}$ bulb runs for $120\ \text{s}$. Find the energy transferred. [2]

3 Exam-style questions

3.1 Electric power is [1]

- | | |
|---|---|
| A | B |
| C | D |
- A** IV
B I/V
C V/I
D IR

3.2 The power dissipated in a resistor can be written as [1]

- | | |
|---|---|
| A | B |
| C | D |
- A** V^2R
B V^2/R
C I/R^2
D IR^2

3.3 A $240\ \text{V}$ heater has a resistance of $60\ \Omega$.

(a) Find the current it draws. [2]

(b) Find the power it dissipates. [2]