

Power and Efficiency

Q1.(2018)

Energy is transferred when a machine is switched on.

- 1000 J is the **input energy transfer**
- 750 J is **useful output energy transfer**

Use the equation: $\text{Efficiency} = \frac{\text{Useful output energy transfer}}{\text{Input energy transfer}}$

Calculate the efficiency of this machine.

- A** 0
- B** 0.25
- C** 0.75
- D** 750

Your answer

[1]

Q2.(2019)

A 30 kW boiler is used for 4 hours.

Calculate the energy transferred.

Use the equation: $\text{energy transferred} = \text{power} \times \text{time}$

- A** 7.5 kWh
- B** 120 kWh
- C** 7500 kWh
- D** 120 000 kWh

Your answer

[1]

Q3.(2019)

The specific latent heat for melting ice is 334 000 J/kg.

Calculate the thermal energy needed to melt 2.0 kg of ice.

- A** 167 J
- B** 668 J
- C** 167 000 J
- D** 668 000 J

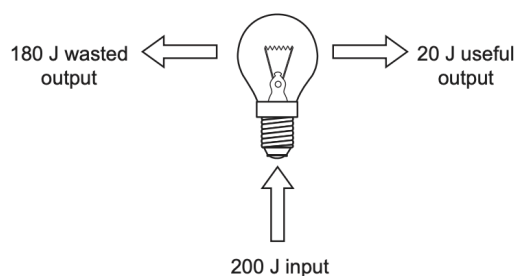
Your answer

[1]

Q4.(2019)

Calculate the efficiency of this light bulb.

Use the equation: $\text{efficiency} = \frac{\text{useful output energy transfer}}{\text{input energy transfer}}$



- A 0.1
- B 0.8
- C 0.9
- D 1.0

Your answer

[1]

Q5.(2020)

A heater transfers 150 000 J of energy in 120 s.

Calculate the power of the heater.

Use the equation: $\text{energy transferred} = \text{power} \times \text{time}$

- A 0.80 W
- B 1.25 W
- C 1250 W
- D 18 000 W

Your answer

[1]

Q6.(2020)

Which row in the table is correct?

Use the equation: $\text{efficiency} = \frac{\text{useful output energy transfer}}{\text{input energy transfer}}$

	Useful output energy transfer (J)	Input energy transfer (J)	Efficiency
A	900	1500	0.6
B	900	1500	1.7
C	1500	900	0.6
D	1500	900	600.0

Your answer

[1]

Q7.(2020)

Fig. 11.2 shows a night-light. It contains a 1.0W lamp and a 3.0V battery.

The student compares the mains filament lamp with the night-light. They are both used for the **same amount of time**.



Fig. 11.2

Use these words to complete the sentences.

You can use each word once, more than once, or not at all.

more than less than equal to

The energy transferred by the night-light is the energy transferred by the mains filament lamp.

The power of the night-light is the power of the mains filament lamp.
[2]

Q8.(2021)

A 2.5kW electric radiator is used for 2 hours.

Calculate the energy transferred.

Use the equation: energy transferred = power $\times$ time

- A 1.25kWh
- B 5kWh
- C 1250kWh
- D 5000kWh

Your answer

[1]

Q9.(2023)

Topic [3]: [Energy]

A student calculates the efficiency of an energy transfer.

The input energy is 1600 J.

The useful output energy is 1200 J.

Which answer shows the correct calculation?

Use the Equation Sheet.

A Efficiency = $\frac{400}{1600}$

B Efficiency = $\frac{1200}{1600}$

C Efficiency = $\frac{1600}{1200}$

D Efficiency = $\frac{1600}{400}$

Your answer

[1]

Q10.(2023)

A 200 g bar of chocolate is melted in a saucepan.

The specific latent heat of melting chocolate is 31.2 J/g.

How much energy is needed to melt the bar of chocolate?

Use the equation: thermal energy for a change in state = mass $\times$ specific latent heat

A 0.156 J

B 6.24 J

C 156 J

D 6240 J

Your answer

[1]

Q11.(2023)

A transformer has an output potential difference of 24 V.

The output current is 5 A.

What is the power output of the transformer?

Use the Equation Sheet.

A 0.21 W

B 4.8 W

C 120 W

D 240 W

Your answer

[1]

Q12.(2024)

Topic [3]: [Energy]

A 2.4 kW heater is used for 2.5 hours each day for 1 week.

Calculate the energy transferred in kWh by the heater in 1 week.

Use the equation: energy transferred = power $\times$ time

Energy transferred in 1 week = kWh [2]