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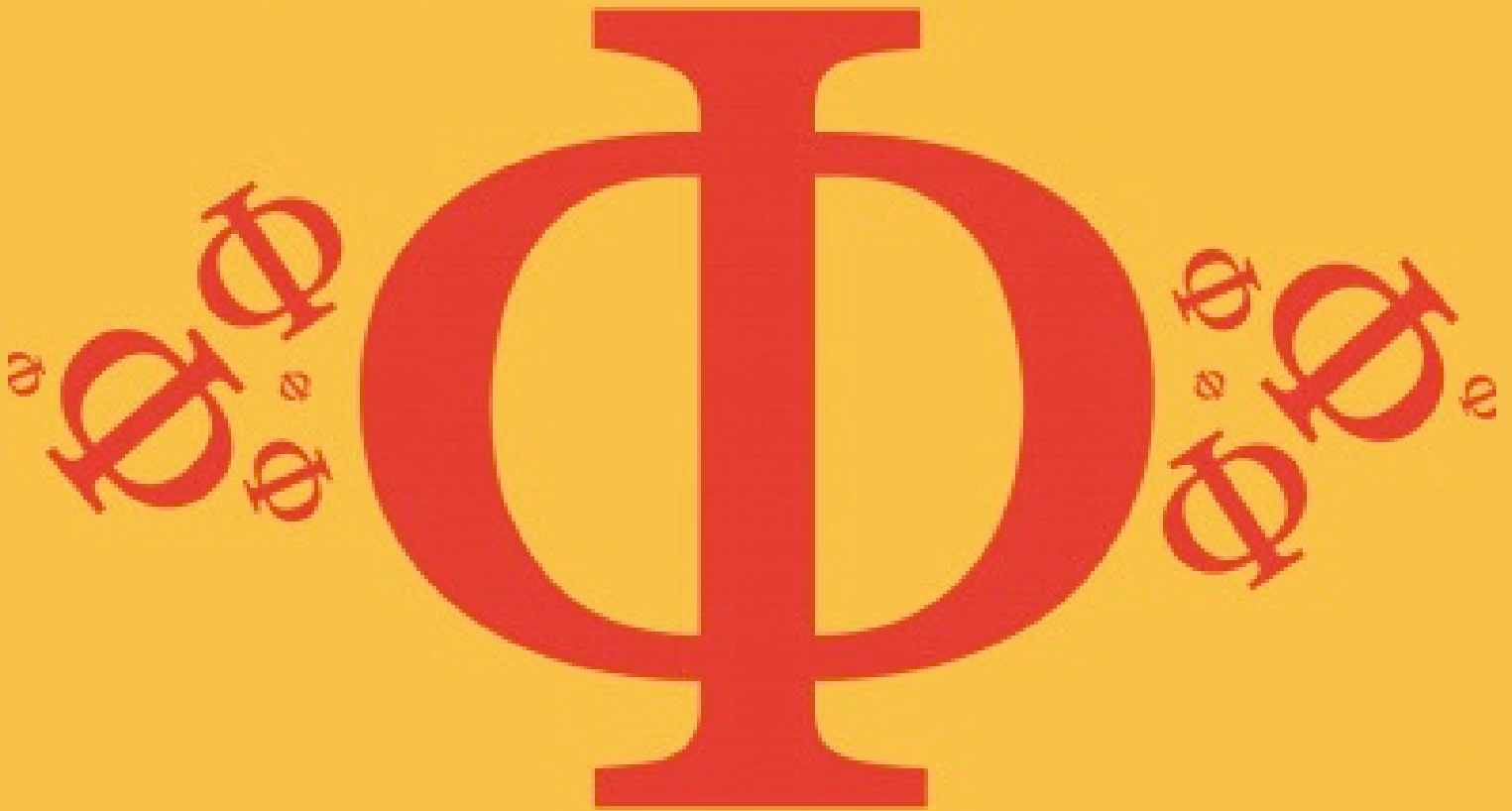
Detailed mark scheme

Suitable for all boards

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8.1 Energy Sources

Easy



PHYSICS

IB HL

8.1 Energy Sources

Question Paper

Course	DP IB Physics
Section	8. Energy Production
Topic	8.1 Energy Sources
Difficulty	Easy

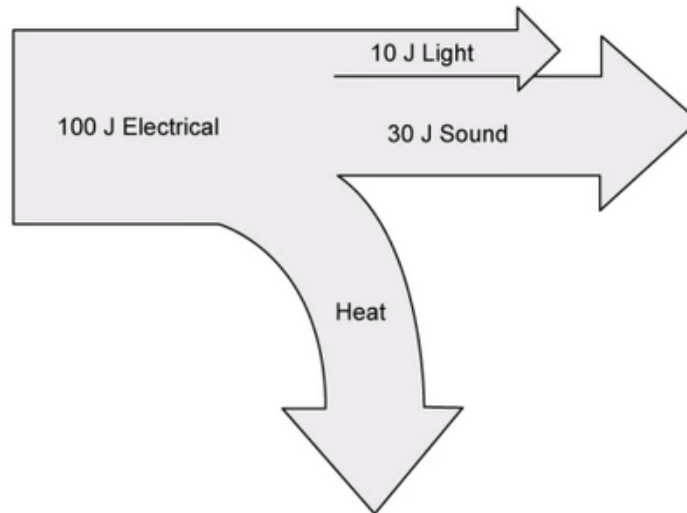
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Time allowed: 20
Score: /10
Percentage: /100

Question 1

The Sankey diagram for a new toaster is being analysed in a laboratory.

What is the correct amount of energy supplied to the bread as heat?



- A. 60 J
- B. 40 J
- C. 100 J
- D. 0 J

[1 mark]

Question 2

A scientist is investigating different primary energy sources.

Which row contains only primary energy sources?

A.	oil	petrol	gas
B.	waste	biofuels	biomass
C.	wave	solar	electricity
D.	wind	geothermal	hydroelectric

[1 mark]

Question 3

Engineers are able to compare fuels by unit to analyse efficiency when designing new cars.

Which of the rows below correctly match the units of specific energy and the energy density?

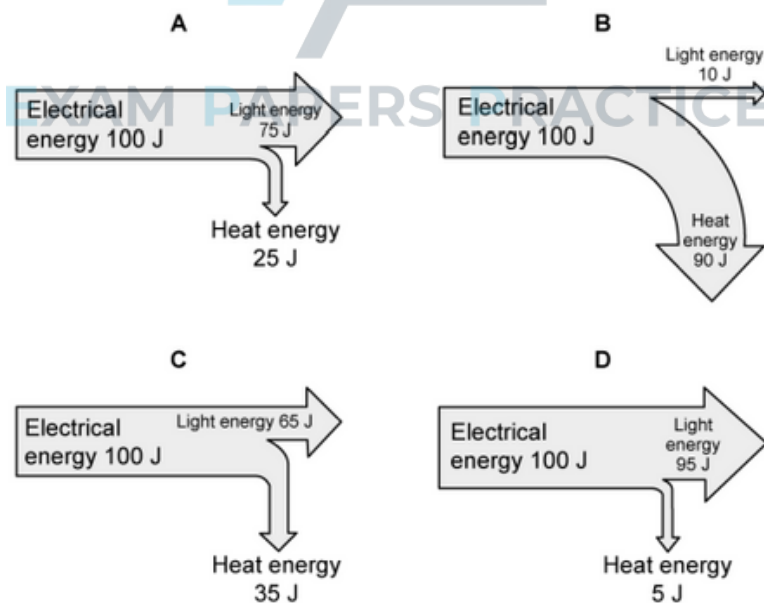
	Specific Energy	Energy Density
A.	J	J
B.	Nm	kg m^{-3}
C.	J kg^{-1}	J m^{-3}
D.	$\text{kg m}^2 \text{s}^{-2}$	J kg m^{-3}

[1 mark]

Question 4

Sankey diagrams are used to represent energy transfers.

Which Sankey diagram shows the most efficient lightbulb?



[1 mark]

Question 5

Fossil fuels are a non-renewable form of energy.

Which statement gives a correct description of how fossil fuels are used to produce electricity?

- A. Burning fossil fuels provides thermal energy to a solar panel causing electrons to be excited and a current to be produced
- B. Burning fossil fuels produces steam, which can turn turbines to generate electricity
- C. Burning fossil fuels provides thermal energy to heat water under the earth, this water produces steam which turns a turbine to produce electricity
- D. In instances of low wind speeds, burning fossil fuels can create steam and thermal energy to rotate big wind turbines

[1 mark]

Question 6

Energy resources can be described as renewable or non-renewable.

Which row gives a correct renewable and a correct non-renewable resource?

	Renewable Resource	Non-Renewable Resource
A.	Solar energy	Wind energy
B.	Coal	Hydroelectricity
C.	Tidal Energy	Nuclear Fission
D.	Natural Gas	Diesel

[1 mark]

Question 7

What is the most common energy source used in central heating systems around the world?

- A. Natural Gas
- B. Electricity
- C. Petrol
- D. Solar

[1 mark]



Question 8

Fuels can be compared per unit by analysing specific energy or energy density.

Which formula is correct for the density of a material?

A. density = specific energy \times energy density

B. density = specific energy + energy density

C. $density = \frac{Energy\ density}{Specific\ energy}$

D. $density = \frac{Specific\ energy}{Energy\ density}$

[1 mark]

Question 9

Solar heating panels and photovoltaic cells can be used in countries where there is bright sunlight for large portions of the day.

Which row identifies the correct statements for the use of both solar heating panels and photovoltaic cells?

	Solar Heating Panels	Photovoltaic Cells
A.	heat tap water	generate electricity
B.	cool drinking water	heat drinking water
C.	store water	store electricity
D.	generate electricity	heat tap water

[1 mark]



Question 10

Energy is consumed from different sources. A survey carried out in 2019 identifies the amount of energy consumed from: coal, oil, natural gas and renewables.

Which row identifies the sources of energy in order of most consumed to least consumed?

	Most Consumed	Second-Most Consumed	Third-Most Consumed	Least Consumed
A.	Coal	Oil	Natural Gas	Renewables
B.	Renewables	Coal	Oil	Natural Gas
C.	Oil	Coal	Natural Gas	Renewables
D.	Natural Gas	Oil	Renewables	Coal

[1 mark]

