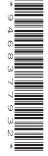


June 2022 only

GCSE (9–1) Physics B (Twenty First Century Science)

J259 01/02/03/04

Data Sheet



INSTRUCTIONS

• Do not send this Data Sheet for marking. Keep it in the centre or recycle it.

INFORMATION

- This Data Sheet is for the June 2022 examination series only.
- This Data Sheet has 4 pages.

Equations in physics

Key:
HT = Higher Tier only

P1 Radiation and waves

wave speed = frequency × wavelength

P2 Sustainable energy

energy transferred = power \times time efficiency = $\frac{\text{useful energy transferred}}{\text{total energy transferred}}$

P3 Electric circuits

charge = current × time

potential difference = current × resistance

potential difference = $\frac{\text{work done (energy transferred)}}{\text{charge}}$ power = $\frac{\text{energy}}{\text{time}}$

energy transferred (work done) = charge flow × potential difference

power = potential difference × current

power = $(current)^2 \times resistance$

HT force = magnetic flux density × current × length of conductor

potential difference across primary coil × current in primary coil = potential difference across secondary coil × current in secondary coil

HT potential difference across primary coil potential difference across secondary coil = number of turns in primary coil number of turns in secondary coil

© OCR 2022 J259 01/02/03/04

P4 Explaining motion

weight = mass × gravitational field strength, g

average speed =
$$\frac{\text{distance}}{\text{time}}$$

$$acceleration = \frac{change in speed}{time taken}$$

 $(final speed)^2 - (initial speed)^2 = 2 \times acceleration \times distance$

HT momentum = mass × velocity

HT change in momentum = resultant force × time for which it acts

moment of a force = force × distance (normal to direction of the force)

force = mass × acceleration

work done = force × distance (along the line of action of the force)

kinetic energy = $0.5 \times \text{mass} \times (\text{speed})^2$

(in a gravity field) gravitational potential energy = mass × gravitational field strength, g × height

$$power = \frac{energy\ transferred}{time}$$

P6 Matter – models and explanations

density =
$$\frac{\text{mass}}{\text{volume}}$$

change in internal energy = mass × specific heat capacity × change in temperature

energy to cause a change of state = mass × specific latent heat

force exerted by a spring = extension × spring constant

energy stored in a stretched spring = $\frac{1}{2}$ × spring constant × (extension)²

 $pressure = \frac{force normal to a surface}{area of that surface}$

for gases: pressure × volume = constant

(for a given mass of gas and at a constant temperature)

HT pressure due to a column of liquid = height of column × density of liquid × g

© OCR 2022 J259 01/02/03/04



Copyright Information

OCR is committed to seeking permission to reproduce all third-party content that it uses in its assessment materials. OCR has attempted to identify and contact all copyright holders whose work is used in this paper. To avoid the issue of disclosure of answer-related information to candidates, all copyright acknowledgements are reproduced in the OCR Copyright Acknowledgements Booklet. This is produced for each series of examinations and is freely available to download from our public website (www.ocr.org.uk) after the live examination series.

If OCR has unwittingly failed to correctly acknowledge or clear any third-party content in this assessment material, OCR will be happy to correct its mistake at the earliest possible opportunity.

For queries or further information please contact The OCR Copyright Team, The Triangle Building, Shaftesbury Road, Cambridge CB2 8EA.

OCR is part of the Cambridge Assessment Group; Cambridge Assessment is the brand name of University of Cambridge Local Examinations Syndicate (UCLES), which is itself a department of the University of Cambridge.

© OCR 2022 J259 01/02/03/04