



Oxford Cambridge and RSA

GCSE Physics B (Twenty First Century Science)
J259/03 Depth in physics (Higher Tier)

Question Set 25

1 Sundip reads an article about a new way to generate electricity.

Scientists have invented 'energy harvesters' called 'twistrons'. Twistrons are made by twisting carbon fibres.

When a twistron changes shape, it can generate electricity. 1 kg of twistrons could generate up to 250 W of electrical power. The efficiency of a twistron is only 1.1%.

In the future, twistrons could be sewn into people's clothes so that they generate electricity as they move around.

(a) (i) Calculate the possible energy transferred from 3.5×10^{-5} kg of twistrons in 1 minute.

Energy output =J [3]

(ii) Calculate the total power supplied for a twistron to transfer a useful output power of 10 W.

Give your answer to 2 significant figures.

Total power =W [3]

(b) (i) Describe a positive impact that twistrons and other similar inventions could have on society.

(ii) Suggest why the scientists decided to give their invention of 'twistron' a short and memorable name. [1]

[1]

Total Marks for Question Set 25: 8

OCR

Oxford Cambridge and RSA

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