

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

Question Set 38

1 Kareem is completing a project on stars.

He finds out this information about three stars.

Star	A	B	C
Temperature (°C)	6000	3000	12 000
Relative diameter	1	900	40
Relative brightness	1	42 000	28 000
Colour	Yellow	Red	Blue

(a) The colour of a star depends on the wavelengths of light that it emits.

Explain why the three stars have different colours.

Use data from the table to support your answer.

[2]

(b) (i) Star **B** is expected to explode in the next few thousand years.
When it explodes, it will emit huge amounts of visible light radiation.

Calculate, in **years**, the time it will take for the visible light radiation to reach the Earth.

The distance from Earth to star **B** is about 6×10^{18} m.

The speed of visible light in space is 3.0×10^8 m/s.

1 year = 3.2×10^7 s.

Time =years [3]

(ii) The explosion will also emit radiation from other regions of the electromagnetic spectrum.

Scientists predict that all this radiation will reach the Earth at the same time.

Explain why.

[1]

Total Marks for Question Set 38: 6

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