

AS Level Physics A
H156/01 Breadth in Physics

Question Set 17

1. (a) Radio waves and X-rays are both electromagnetic waves.
State one difference between radio waves and X-rays.

[1]

- (b) (i) Procyon is a star of radius 1.4×10^9 m. The total output power of the electromagnetic radiation from its surface is 2.7×10^{27} W. The average wavelength of the electromagnetic waves from Procyon is 5.0×10^{-7} m.

Show that the surface intensity of the radiation from Procyon is $1.1 \times 10^8 \text{ W m}^{-2}$.

[2]

- (ii) Calculate the energy of a photon of wavelength 5.0×10^{-7} m.

energy = _____ J

[2]

- (iii) Estimate the total number of photons emitted per second from the surface of Procyon.

number per second = _____ s^{-1}

[1]

Total Marks for Question Set 17: 6

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