

Multiple Choice Questions

EM Radiation From Stars

Electron Energy Levels / Emission Spectra & Energy Levels / Identifying Elements Within Stars Using Spectral Lines / Continuous, Emission Line & Absorption Line Spectrum / Transmission Diffraction Grating / Wein's Displacement Law / Stefan's Law / Estimating the Radius of Stars

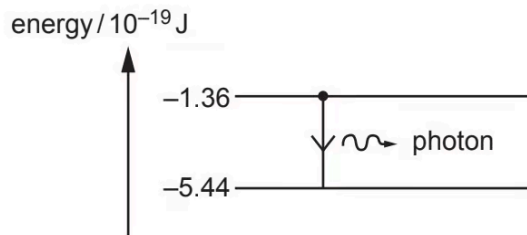
Medium (1 question)	/1
Hard (4 questions)	/4
Total Marks	/5

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Medium Questions

- 1 The diagram below shows two energy levels for the electron in the hydrogen atom.



The electron makes the transition shown by the arrow.

What is the wavelength of the photon emitted?

- A. 293 nm
- B. 366 nm
- C. 488 nm
- D. 1460 nm

(1 mark)

Hard Questions

- 1 Laser light of wavelength of 640 nm is incident normally at a diffraction grating.

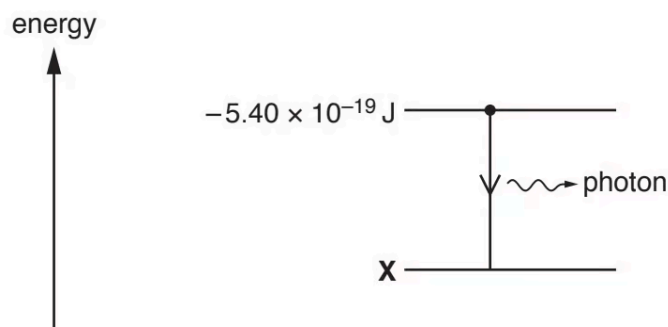
The separation between adjacent lines (slits) is 3.3×10^{-6} m.

What is the **total** number of bright spots that can be observed in the diffraction pattern?

- A. 5
- B. 6
- C. 10
- D. 11

(1 mark)

- 2 An electron makes a transition between the two energy levels shown below.



This transition produces a photon of frequency 4.10×10^{14} Hz. What is the value of the energy level X?

- A. $-2.68 \times 10^{-19} \text{ J}$
- B. $-2.72 \times 10^{-19} \text{ J}$
- C. $-5.40 \times 10^{-19} \text{ J}$
- D. $-8.12 \times 10^{-19} \text{ J}$

(1 mark)

- 3 The intensity against wavelength graph of an object at 750°C peaks at a wavelength of λ . The temperature of the object is raised to 960°C .

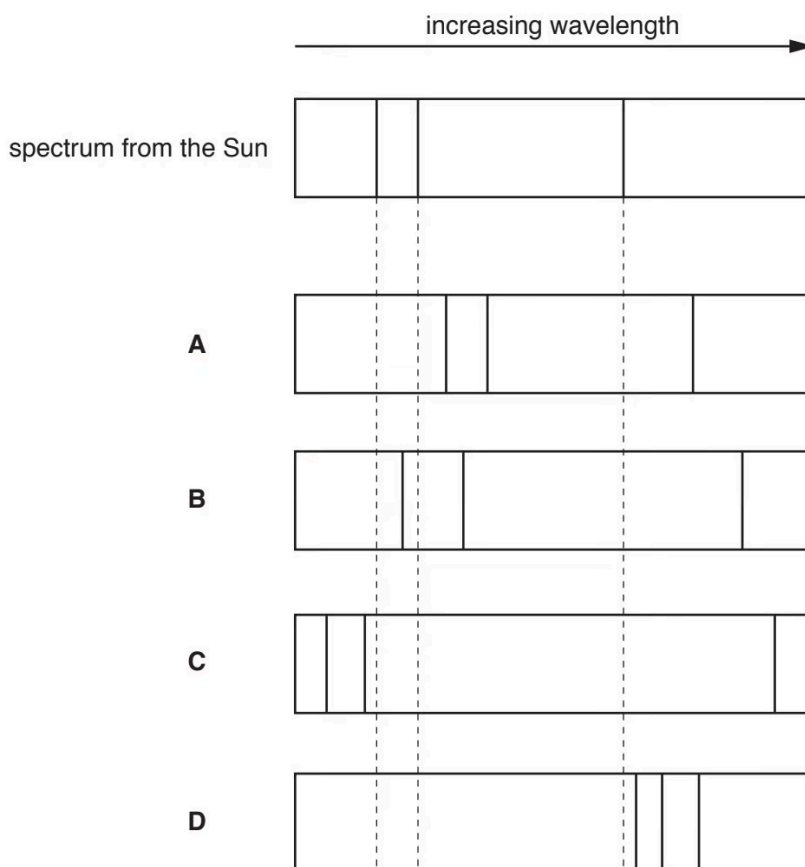
What is the wavelength now at the new peak intensity in terms of λ ?

- A. 0.78λ
- B. 0.83λ
- C. 1.2λ
- D. 1.3λ

(1 mark)

- 4 Part of the line spectrum for light from the Sun is shown below.

Which spectrum best shows light from a similar star to the Sun?



(1 mark)