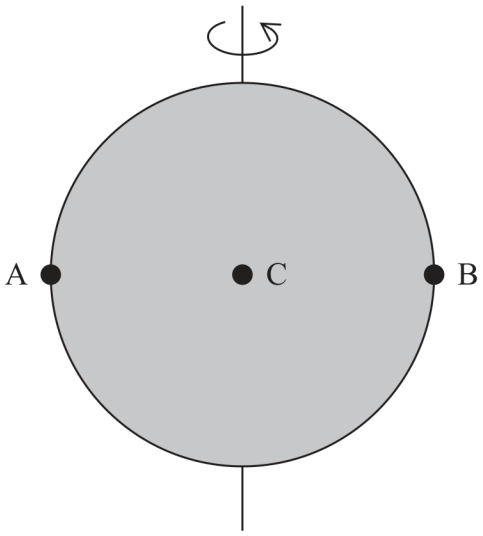
16 The diagram shows the Sun rotating about its axis as viewed from the Earth.

A, B and C are points on the surface of the Sun.



Light from points A, B and C is analysed. The wavelength λ_α of the alpha line in the hydrogen spectrum is determined for the light from each point.

(a) Complete the table with the letters A, B and C to indicate the point corresponding to each wavelength.

(1)

λ_α / nm	Point
656.2837	
656.2797	
656.2757	

(b) Explain why there is a variation in the wavelength of the light from different points on the Sun.

(2)

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(c) In the laboratory, the wavelength of the alpha line in the hydrogen spectrum is 656.2797 nm.

Assess whether this is consistent with the Sun having a period of rotation approximately equal to 28 days.

radius of the Sun = 7.0×10^8 m
1 day = 86 400 s

(4)

(Total for Question 16 = 7 marks)