a fleet of si	mall probes to Pro	xima Centauri, the ne			
			Centauri is 3.25 ×	$10^{-11} \text{ W m}^{-2}$ .	
(i) Sho	Show that the luminosity of Proxima Centauri is about $0.002 L_{\odot}$ .				(2)
distance to Proxima Centauri = $4.00 \times 10^{16}$ m $L_{\odot} = 3.85 \times 10^{26}$ W					(3)
(ii) Pro	oxima Centauri is o	lescribed on a websit	e as a main sequer	nce star.	
					with
					(3)
	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$				
	24 000	12 000	6000	3000	
		Temp	erature / K		
	a fleet of so would take  (a) The race The lunch (i) Show the distribution of the lunch (ii) Properties a possible of the lunch (iii) Properties a possible of the lunch (iiii) Properties a possible of the lunch (iiiii) Properties a possible of the lunch (iiiiii) Properties a possible of the lunch (iiiiiiiiii) Properties a possible of the lunch (iiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii	a fleet of small probes to Prowould take about twenty year  (a) The radiation intensity at The luminosity of the Sur (i) Show that the lumino distance to Proxima C $L_{\odot} = 3.85 \times 10^{26} \mathrm{W}$ (ii) Proxima Centauri is a Determine whether that a position on the main radius of Proxima Ce $10^{6}$ $10^{4}$ $10^{2}$	a fleet of small probes to Proxima Centauri, the new would take about twenty years.  (a) The radiation intensity at Earth from Proxima The luminosity of the Sun is $L_{\odot}$ .  (i) Show that the luminosity of Proxima Centauri = $4.00 \times 10^{16}$ distance to Proxima Centauri = $4.00 \times 10^{16}$ $L_{\odot} = 3.85 \times 10^{26}$ W  (ii) Proxima Centauri is described on a website Determine whether the surface temperature a position on the main sequence of the Her radius of Proxima Centauri = $9.81 \times 10^{7}$ m $10^{6}$ $10^{4}$ $10^{2}$ $10^{2}$ $10^{2}$ $10^{4}$ $10^{2}$ $10^{4}$ $10^{2}$ $10^{4}$ $10^{2}$ $10^{4}$ $10^{2}$ $10^{4}$ $10^{2}$ $10^{4}$ $10^{2}$ $10^{4}$ $10^{2}$ $10^{4}$ $10^{2}$ $10^{4}$ $10^{2}$ $10^{4}$ $10^{2}$ $10^{4}$ $10^{2}$	a fleet of small probes to Proxima Centauri, the nearest star to the S would take about twenty years.  (a) The radiation intensity at Earth from Proxima Centauri is $3.25 \times 10^{10}$ The luminosity of the Sun is $L_{\odot}$ .  (i) Show that the luminosity of Proxima Centauri is about $0.002$ distance to Proxima Centauri = $4.00 \times 10^{16}$ m $L_{\odot} = 3.85 \times 10^{26}$ W  (ii) Proxima Centauri is described on a website as a main sequence Determine whether the surface temperature of Proxima Centa a position on the main sequence of the Hertzsprung-Russell radius of Proxima Centauri = $9.81 \times 10^{7}$ m $10^{6} - \frac{10^{4}}{10^{4}} - \frac{10^{2}}{10^{4}} - \frac{10^{2}}{10^{4}} - \frac{10^{2}}{10^{4}} - \frac{10^{2}}{10^{4}} - \frac{10^{2}}{10^{4}} - \frac{10^{2}}{10^{4}} - \frac{10^{4}}{10^{4}} - \frac{10^{4}}{10^{4}}$	(a) The radiation intensity at Earth from Proxima Centauri is $3.25 \times 10^{-11}$ W m $^{-2}$ . The luminosity of the Sun is $L_{\odot}$ .  (i) Show that the luminosity of Proxima Centauri is about $0.002~L_{\odot}$ . distance to Proxima Centauri $= 4.00 \times 10^{16}$ m $L_{\odot} = 3.85 \times 10^{26}$ W  (ii) Proxima Centauri is described on a website as a main sequence star. Determine whether the surface temperature of Proxima Centauri is consistent a position on the main sequence of the Hertzsprung-Russell diagram. radius of Proxima Centauri $= 9.81 \times 10^7$ m $10^6 - 10^4 - $

(b) The composition of a star can be determined by analysis of its absorption spectrum.

Explain why there are certain specific frequencies missing from the spectrum.

(c) Describe how the distance to nearby stars like Proxima Centauri is determined.

(Total for Question 19 = 14 marks)

(3)