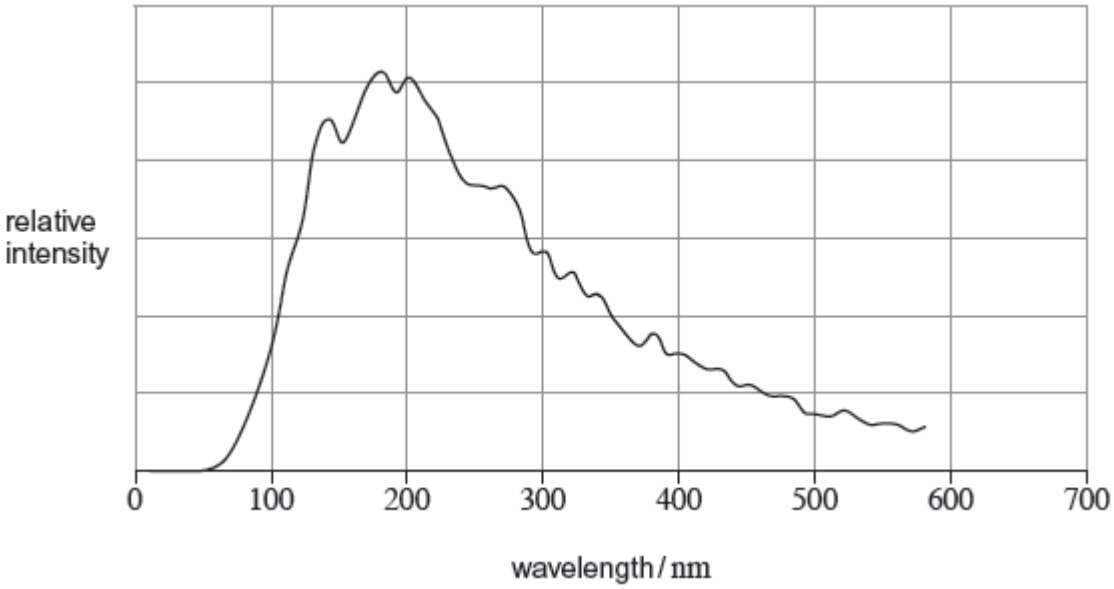
Q1. The graph shows the variation of intensity with wavelength for the star 40 Eridani B.



(a) (i) Calculate the black body temperature of 40 Eridani B.

State an appropriate unit for your answer.

temperature = ... unit .....

(3)

(ii) 40 Eridani B has a total power output of 4.2×10^{24} W.

Calculate its radius.

radius = ... m

(2)

(b) (i) Which of the following regions of the Hertzsprung-Russell diagram does 40 Eridani B belong to?
Tick (✓) the correct answer.

main sequence	
dwarf star	
giant star	

(1)

(ii) Give reasons for your answer to part (i).

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(2)
(Total 8 marks)

Q2. The Summer Triangle consists of three stars, Altair, Deneb and Vega.
Some of the properties of the three stars are summarised in the table below.

	Altair	**Deneb**	**Vega**
surface temperature / K	7700	8500	9600

apparent magnitude	0.77	1.25	0.03
absolute magnitude	2.21	–8.38	0.60

(a) The three stars belong to the same spectral class.

State and explain which spectral class they belong to.

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(2)

(b) Deduce which of the three stars appears brightest.

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(2)

(c) Calculate the distance from Earth to the closest of the three stars.

distance = _____ pc

(3)

(d) Deduce which of the three stars is the largest.

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(3)

(e) Calculate the wavelength of the peak in the black body radiation curve of Altair.

wavelength = _____ m

(2)
(Total 12 marks)