Examiner only

Answer the following questions in your own words. Extended quotes from the original article will not be awarded marks.

(a) Write down the complete life cycle of a mid-sized star (see **Figure 1**). [1]

Star-forming nebula ⟶

(b) Suggest an advantage of placing telescopes *in space* to observe new stars (see Paragraph 2). [1]

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.....

.....

(c) In **Figure 2** or **3** below, mark with an **X** one area where new stars are forming (see Paragraph 3 and **Figures 2** & **3**). [1]

Figure 2 (infra-red image)

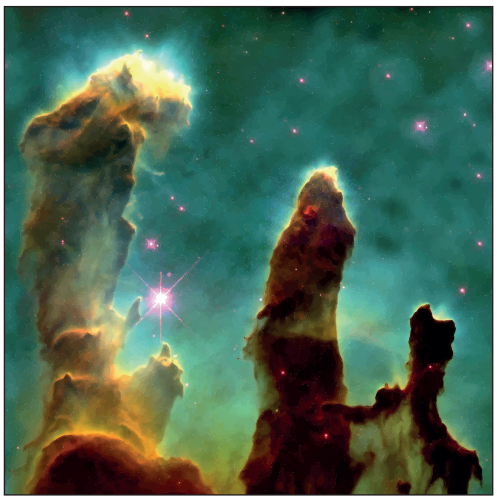

Figure 3 (visible light image)

Examiner only

(d) Explain, using Newton's 2nd law, how electromagnetic radiation exerts pressure inside a main sequence star (see Paragraph 4). [3]

(e) Explain why a more massive star has a higher density in its core and why this leads to a higher temperature (see Paragraph 4). [3]

(f) (i) Show that the wavelength of maximum emission for the hottest main sequence stars is approximately 150 nm (see Paragraph 5 or Graph 1). [2]

(ii) Discuss whether or not it is appropriate to analyse the hottest main sequence stars using visible light when their wavelength of maximum emission is 150 nm (see Paragraph 5). [2]

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(g) Determine whether or not the star of mass 0.2 $M_\odot$ is plotted at approximately the correct luminosity in Graph 1 (see Equations 1–4 and Graph 1). [2]

(h) Explain why a 10 $M_\odot$ star has a lifetime that is 500 times shorter than that of the Sun, including any simplifying assumptions (see Paragraph 8 and Equations 1–5). [4]

(i) Explain **briefly** what the author means when he states that a white dwarf's mass and radius are negatively correlated (see Paragraph 9). [1]

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END OF PAPER