

- (b) (i) Briefly explain why a star of mass $0.5M_{\odot}$ collapses to form a white dwarf when the nuclear reactions in its core cease.
- (ii) What is the maximum theoretical mass of a white dwarf? Describe (*in about 100 words*) what happens to a star if its mass exceeds this value.
- (iii) What is the maximum theoretical mass of a neutron star? What typical values are derived from observations?
- (iv) Why, despite your answer to parts (ii) and (iii) above, does a main sequence star of $5M_{\odot}$ also form a white dwarf at the end of its life?

(8 marks)