12 A massive planet orbits the red dwarf star Gliese 876. The planet was discovered after wavelength shifts in spectral lines were seen in the light received from the star.

(a) Explain how a massive planet orbiting a star can cause a change in the wavelength of light received from the star.

(3)

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(b) The maximum shift in a spectral line of wavelength 4.35×10^{-7} m in the light received from Gliese 876 is 3.19×10^{-13} m.

Calculate the maximum velocity of Gliese 876 away from the Earth.

(2)

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Maximum velocity = ...

(Total for Question 12 = 5 marks)

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