

- 8 (a) (i) A galaxy moves away from the Earth at a speed of  $3.9 \times 10^4$  km/s.

The speed of light is  $3.0 \times 10^5$  km/s.

Light from the galaxy is emitted with a wavelength of  $6.2 \times 10^{-7}$  m.

Calculate the change in the wavelength of the light that is received by an observer on the Earth.

(3)

change in wavelength = ..... m

- (ii) Calculate the wavelength of light that is received by an observer on the Earth.

(1)

wavelength = ..... m

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(b) One of the pieces of evidence for the Big Bang theory is the red-shift of galaxies.

Explain how the red-shift of galaxies supports the Big Bang theory.

(3)

**(Total for Question 8 = 7 marks)**

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