

# The Origins of the Universe

## Answer the following questions

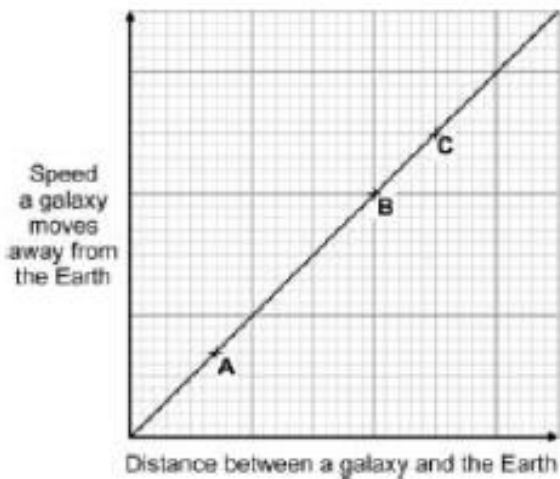
① Scientists have observed that the wavelengths of the light given out from galaxies that are moving away from the Earth are longer than expected.

a) Draw a ring around the correct answer to complete the following sentence.

This observation gives evidence for the idea that the Universe is  
shrinking.  
not changing.  
expanding.

b) The graph shows that there is a link between the speed at which a galaxy moves away from the Earth and the distance of the galaxy from the Earth.

The positions of three galaxies, A, B and C, are marked on the graph.



From which galaxy, A, B or C, would the wavelength of the light reaching the Earth seem to have changed the most?

Galaxy \_\_\_\_\_

Give a reason for your answer.

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- c)** 'Red shift' is one of the pieces of evidence which led scientists to propose the 'big bang' theory. Describe, in your own words, the big bang theory.

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- d)** The 'steady state' theory was once a popular alternative to the 'big bang' theory. The 'steady state' theory suggested that the universe, although expanding, had no origin and it has always existed. As the universe expands, a small amount of matter is created to keep the universe looking exactly the same all of the time.

When considering the origin of the universe, what is the difference between the 'big bang' theory and the 'steady state' theory?

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