Student book answers

6.4 The galaxies are moving apart

Pages 146–147

Check your learning 6.4

Remember and understand

1 How would you know you were looking at an absorption spectrum?

When you are looking at an absorption spectrum, you are seeing a full spectrum of colours with black lines present.

Apply and analyse

2 How are the emission and absorption spectra for helium similar?

The missing (black) lines on the absorption spectrum for helium would be the same as the coloured lines on the emission spectrum for helium.

3 How does red-shifted light show that a galaxy is moving away from us?

Red light has a lower frequency than blue light, so the colours of light that have been absorbed would appear to have shifted towards the red end of the spectrum when a galaxy is moving away from us.

4 Figure 6.16 shows the spectra observed from three stars. Star A is at a fixed distance from the Earth, whereas stars B and C are moving.

a What produces the dark lines on each spectrum?

The dark lines are the colours (frequencies) of light that have been absorbed by a gas, usually located around the stars.

b Which star, B or C, is moving towards the Earth? Explain your answer.

Star C is moving towards the Earth as the absorption spectrum is shifted to the blue end.