AQA - Space physics – GCSE Physics

1. June/2020/Paper_2F/No.2

0 2 Our solar system includes the Sun, planets and moons.

0 2 . 1 Complete the sentence.

Choose the answer from the box.

[1 mark]

Andromeda	**Milky Way**	**Pinwheel**	**Whirlpool**

Our solar system is part of the _____ galaxy.

0 2 . 2 Planets orbit the Sun.

What force causes planets to orbit the Sun?

[1 mark]

_____

Table 2 shows data about five planets.

Table 2

Planet	Mean distance from the Sun in millions of kilometres	Mean surface temperature in °C
Earth	150	+22
Mars	228	–48
Jupiter	778	**X**
Saturn	1430	–178
Uranus	2870	–200

0 2 . 3 How does the mean surface temperature of the planets in **Table 2** change as the mean distance from the Sun increases?

[1 mark]

0 2 . 4 Predict the mean surface temperature of Jupiter (**X**) in **Table 2**.

[1 mark]

Mean surface temperature of Jupiter = _____ °C

0 2 . 5 Five of the planets in the solar system are given in **Table 2**.

How many other planets are there in the solar system?

[1 mark]

Tick (✓) **one** box.

- Two ☐
- Three ☐
- Four ☐
- Five ☐

0 2 . 6 Our Moon is a natural satellite.

Why is the Moon classified as a satellite?

[1 mark]

Tick (✓) **one** box.

It has no atmosphere. ☐

It has no gravitational field. ☐

It is too small to be a planet. ☐

It orbits a planet. ☐

0 2 . 7 How are planets and moons similar?

[2 marks]

Tick (✓) **two** boxes.

Their mass is about the same. ☐

Their orbits are circular. ☐

Their surfaces are the same colour. ☐

They are similar in diameter. ☐

They do not emit visible light. ☐

0 2 . 8 The diameter of the Earth is 13 000 km.

The diameter of the Sun is 110 times greater than the diameter of the Earth.

Calculate the diameter of the Sun.

[2 marks]

Diameter of the Sun = _____ km

2. June/2020/Paper_2F/No.9

0 9 . 1 Complete the sentences.

[2 marks]

The Sun is a stable star. This is because the forces pulling inwards caused by _____ are in equilibrium with the forces pushing outwards caused by the energy released by nuclear _____.

0 9 . 2 Write down the equation that links distance travelled (s), speed (v) and time (t).

[1 mark]

_____

0 9 . 3 The mean distance between the Sun and the Earth is 1.5×10^{11} m.

Light travels at a speed of 3.0×10^{8} m/s.

Calculate the time taken for light from the Sun to reach the Earth.

[3 marks]

_____

_____

_____

_____

_____

Time = _____ s

0 9 . 4 Some stars are much more massive than the Sun.

Describe the life cycle of stars much more massive than the Sun, including the formation of new elements.

[6 marks]

0 9 . 5 Stars emit radiation with a range of wavelengths.

Which property of a star does the range of wavelengths depend on?

[1 mark]

Tick (✓) **one** box.

Density ☐

Mass ☐

Temperature ☐

Volume ☐

3. June/2020/Paper_2H/No.2

0 2 . 1 Complete the sentences.

[2 marks]

The Sun is a stable star. This is because the forces pulling inwards caused by _____ are in equilibrium with the forces pushing outwards caused by the energy released by nuclear _____.

0 2 . 2 Write down the equation that links distance travelled (s), speed (v) and time (t).

[1 mark]

_____

0 2 . 3 The mean distance between the Sun and the Earth is 1.5×10^{11} m.

Light travels at a speed of 3.0×10^{8} m/s.

Calculate the time taken for light from the Sun to reach the Earth.

[3 marks]

_____

_____

_____

_____

_____

Time = _____ s

0 2 . 4 Some stars are much more massive than the Sun.

Describe the life cycle of stars much more massive than the Sun, including the formation of new elements.

[6 marks]

0 2 . 5 Stars emit radiation with a range of wavelengths.

Which property of a star does the range of wavelengths depend on?

[1 mark]

Tick (✓) **one** box.

Density ☐

Mass ☐

Temperature ☐

Volume ☐

4. June/2019/Paper_2F/No.2

0 2 Most galaxies are moving away from the Earth. Scientists can determine the speed of a galaxy by observing the light from the galaxy.

0 2 . 1 Complete the sentence.

Choose the answer from the box.

[1 mark]

frequency	**speed**	**wavelength**

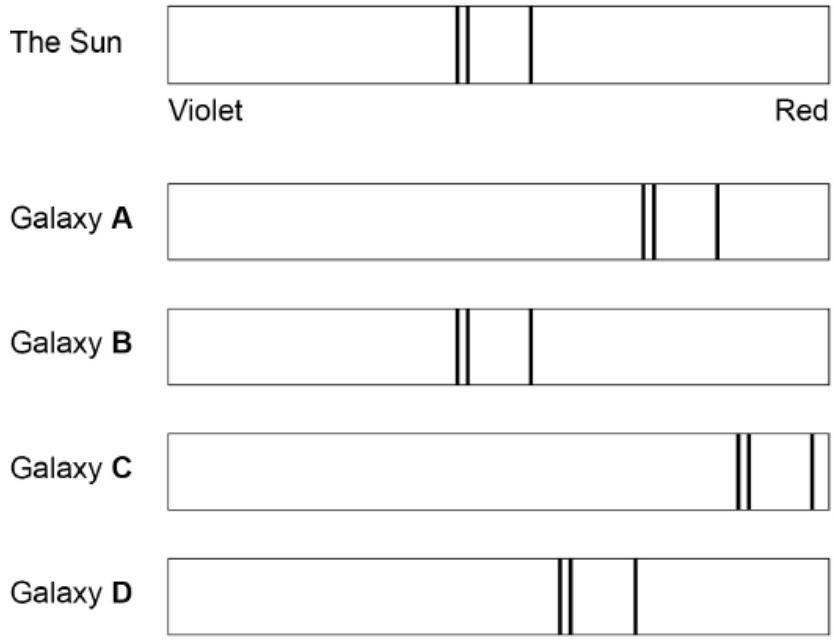
When scientists observe the light from distant galaxies, they observe an increase in the _____ of light from those galaxies.

The light spectra from stars and galaxies include dark lines.

The lines have the same pattern.

Figure 3 shows the light spectrum from the Sun and from four galaxies.

Figure 3



0 2 . 2 Which galaxy is moving the fastest away from the Earth?

[1 mark]

Tick (✓) **one** box.

A ☐ **B** ☐ **C** ☐ **D** ☐

0 2 . 3 Which galaxy is the furthest away from the Earth?

[1 mark]

Tick (✓) **one** box.

A ☐ **B** ☐ **C** ☐ **D** ☐

0 2 . 4 The Big Bang theory is one way to explain the origin of the universe.

How does the Big Bang theory describe the universe when it began?

[1 mark]

Tick (✓) **one** box.

Very big and very dense ☐

Very big and extremely hot ☐

Very dense and extremely hot ☐

Very small and extremely cold ☐

0 2 . 5 Which statement about the Big Bang theory is correct?

[1 mark]

Tick (✓) **one** box.

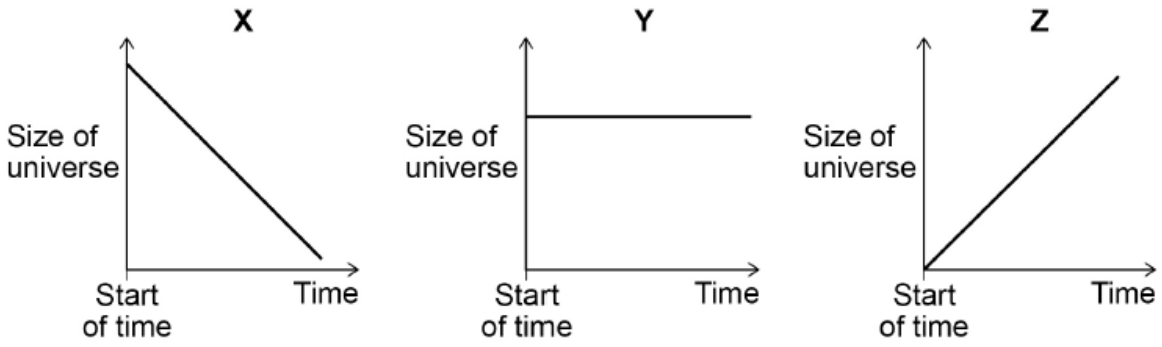
Scientists have proved that the theory is correct. ☐

Scientific evidence supports the theory. ☐

There is no other way to explain the origin of the universe. ☐

0 2 . 6 **Figure 4** shows three ways that the size of the universe may have changed with time.

Figure 4



Which graph would the Big Bang theory suggest is correct?

[2 marks]

Tick (✓) **one** box.

X ☐ **Y** ☐ **Z** ☐

Give a reason for your answer.

_____

_____

5. June/2019/Paper_2H/No.5

0 5 . 1 The light from distant galaxies shows red-shift.

Complete the sentence.

[1 mark]

The term red-shift describes the observed increase

in the _____ of the light from a distant galaxy.

0 5 . 2 The Big Bang theory is one model used to explain the origin of the universe.

How does the Big Bang theory describe the universe when it began?

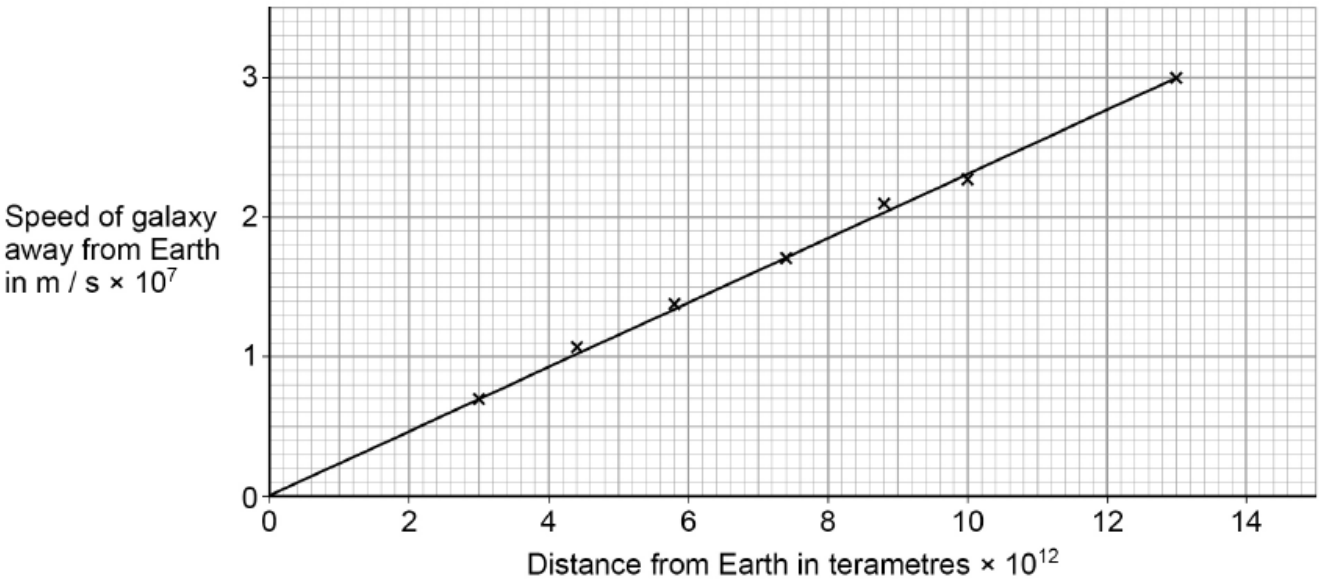
[1 mark]

_____

_____

Figure 9 shows data scientists have calculated from measurements of red-shift.

Figure 9



0 5 . 3 Describe the relationship between the speed of a galaxy and the distance the galaxy is from the Earth.

[1 mark]

0 5 . 4 Which of the following is the same as 6×10^{12} terametres?

[1 mark]

Tick (✓) **one** box.

6×10^{15} m ☐

6×10^{18} m ☐

6×10^{21} m ☐

6×10^{24} m ☐

0 5 . 5 Explain how the data in **Figure 9** supports the suggestion that the universe began from a very small region.

[2 marks]

0 5 . 6 The Big Bang theory suggested that gravity would slow the rate at which galaxies move away from the Earth.

New observations suggest that distant galaxies are moving away from the Earth at an increasingly fast rate.

What do the new observations suggest is happening to the universe?

[1 mark]

0 5 . 7 New observations and data that do not fit existing theories should undergo peer review.

Give **one** reason why peer review is an important process.

[1 mark]

0 5 . 8 The Andromeda galaxy is moving towards the Earth.

Describe how the wavelength and frequency of the light from Andromeda seem to have changed when viewed from the Earth.

[2 marks]