Space physics – GCSE Physics Paper 2

1. No.1

0 1 A group of stars is called a galaxy.

0 1 . 1 What is the name of our galaxy?

[1 mark]

Tick (✓) **one** box.

- Black Eye ☐
- Hockey Stick ☐
- Milky Way ☐
- Sculptor Dwarf ☐

0 1 . 2 The Sun is one of the stars in our galaxy.

What was the Sun originally formed from?

[1 mark]

Tick (✓) **one** box.

- Dust and gas ☐
- Heavy elements ☐
- Oxygen ☐

0 1 . 3 Which of the following forces was involved in the formation of the Sun?

[1 mark]

Tick (✓) **one** box.

Electrostatic force ☐

Gravitational force ☐

Magnetic force ☐

0 1 . 4 Stars produce light because they release energy.

Complete the sentence.

Choose the answer from the box.

[1 mark]

combustion	**conduction**	**fusion**

The process which releases energy inside stars is _____.

0 1 . 5 Visible light and infrared radiation travel from the Sun to the Earth.

Which statement describes the time taken for visible light and infrared radiation to travel from the Sun to the Earth?

[1 mark]

Tick (✓) **one** box.

Visible light takes less time than infrared radiation ☐

Visible light takes the same time as infrared radiation ☐

Visible light takes more time than infrared radiation ☐

0 1 . 6 Infrared radiation has a longer wavelength than visible light.

Complete the sentence.

Choose the answer from the box.

[1 mark]

smaller	**the same**	**greater**

Compared with the frequency of infrared radiation, the frequency of

visible light is _____.

0 1 . 7 The Sun and the Earth both emit infrared radiation.

How does the rate of infrared radiation emitted by the Sun compare with the rate of infrared radiation emitted by the Earth?

Give a reason for your answer.

[2 marks]

Tick (✓) **one** box.

Lower rate than the Earth ☐

Same rate as the Earth ☐

Greater rate than the Earth ☐

Reason _____

_____

2. No.3

0 3 The Universe contains many stars.

0 3 . 1 The Sun is the star at the centre of our solar system.

Give **three** other types of object that form our solar system.

[3 marks]

1 _____

2 _____

3 _____

Some main sequence stars will eventually form black holes.

Table 3 gives the mass of four stars.

Table 3

Star	Mass in kg
Arcturus	2.2×10^{30}
Betelgeuse	2.2×10^{31}
Cygni A	1.4×10^{30}
The Sun	2.0×10^{30}

0 3 . 2 Which star in **Table 3** is most likely to form a black hole?

[1 mark]

_____

0 3 . 3 The distance from Cygni A to the Earth is 1.1×10^8 gigametres.

Which distance is the same as 1.1×10^8 gigametres?

[1 mark]

Tick (✓) **one** box.

1.1×10^{11} m ☐

1.1×10^{14} m ☐

1.1×10^{17} m ☐

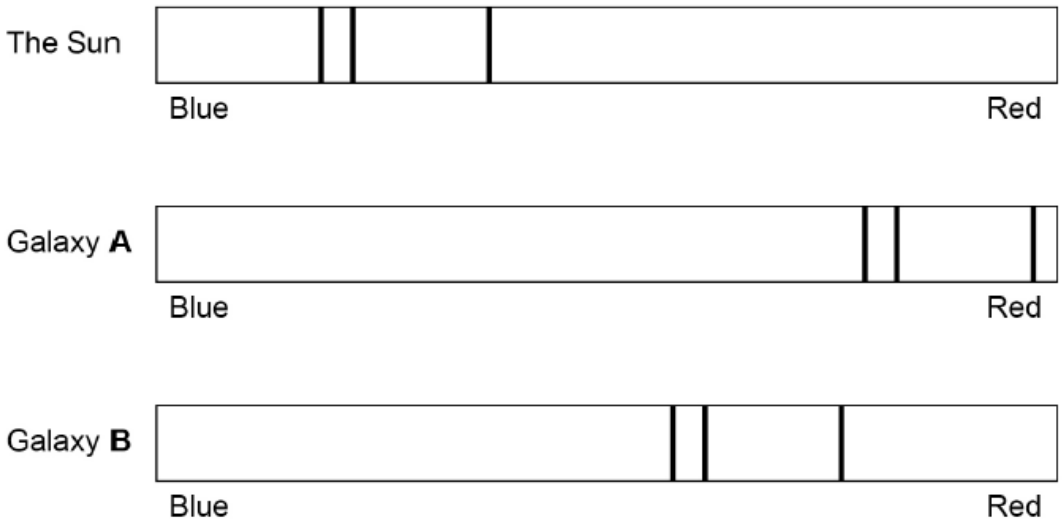
1.1×10^{20} m ☐

0 3 . 4 The light spectrum from every galaxy includes dark lines.

The lines have the same pattern.

Figure 7 shows the position of dark lines in the visible spectra of light from the Sun and from two distant galaxies.

Figure 7



Explain what these light spectra tell us about the velocities of galaxy **A** and galaxy **B**.

[3 marks]

0 3 . 5 The distance between Arcturus and the Earth is 3.6×10^{14} km.

speed of light = 3.0×10^{8} m/s

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

Use the Physics Equations Sheet.

[4 marks]

Time taken = _____ s

0 3 . 6 When stars are formed, they contain mostly hydrogen.

Describe how stars produce all other naturally occurring elements.

[4 marks]