Questions

Q1.

Which row of the table shows these objects in the correct order of size?
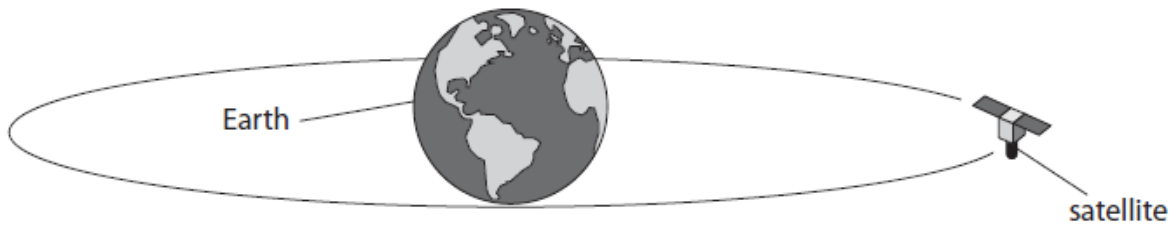
Put a cross (☒) in the box next to your answer.

(1)

	smallest ──────────► biggest		
☒ **A**	Milky Way	Solar System	Universe
☒ **B**	Milky Way	Universe	Solar System
☒ **C**	Solar System	Universe	Milky Way
☒ **D**	Solar System	Milky Way	Universe

Q2.

Figure 20 shows a satellite orbiting the Earth.

Figure 20

(i) State the name of the force that keeps the satellite in orbit around the Earth.

(1)

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(ii) Draw an arrow on Figure 20 to show the direction of the force acting on the satellite, that keeps the satellite in orbit around the Earth.

Label this arrow 'F'.

(1)

(Total for question = 2 marks)

Q3.

 The table gives information about the diameters and distances of the four planets closest to the Sun.

planet	distance from the Sun / AU	diameter of the planet / km
Mercury	0.39	4 900
Venus	0.72	12 100
Earth	1.00	12 800
Mars	1.52	6 800

(i) Put the information about the diameter of the planets on to the bar chart.

The diameter for Earth has been done for you.

(2)
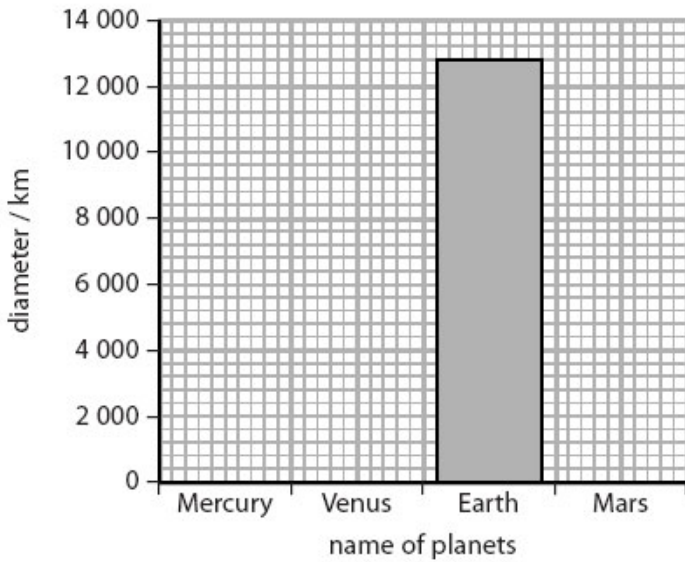
(ii) The distance of the planets from the Sun has been given in Astronomical Units (AU).
1 AU is 150 000 000 km.
Calculate the distance of Mars from the Sun in kilometres.

(2)

distance of Mars from the Sun = ...km

Q4.

(i) A long time ago, scientists believed that the Earth was at the centre of the Solar System.

Evidence has since proved that the Sun is at the centre of the Solar System.

State **one other** idea about the Solar System that **has** changed over time.

(1)

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(ii) Figure 13 shows data for some of the planets of the Solar System.
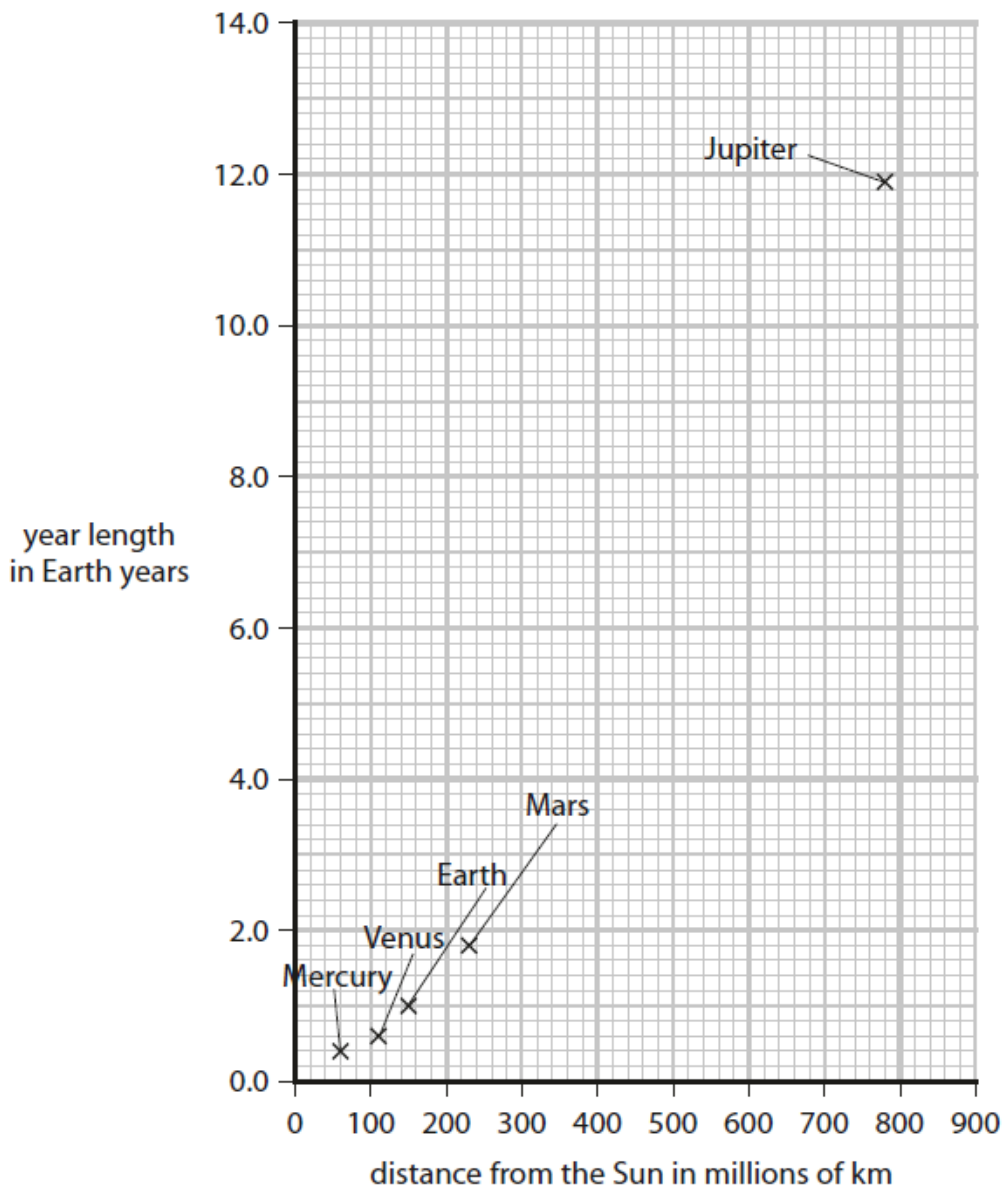
Figure 13

Ceres is an asteroid that orbits the Sun between Mars and Jupiter. It takes Ceres 4.6 Earth years to make one orbit of the Sun.

Use the graph to estimate the distance of Ceres from the Sun.

Show your working.

(3)

distance of Ceres from the Sun = ... millions of km

(Total for question = 4 marks)

Q5.

* A long time ago, astronomers thought that the Earth was the centre of the Universe.

This was called the geocentric model.
The evidence for this model came from observations of the sky using the naked eye.

After the telescope was invented, astronomers quickly gathered evidence which showed that the geocentric model is not correct.

Describe the evidence both for the geocentric model and against the geocentric model.

(6)

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Q6.

When light strikes a glass surface it can be both refracted and reflected.

In 1610 Galileo used a refracting telescope to observe the planet Jupiter.

 (i) Explain how a refracting telescope produces a magnified image of Jupiter.

(3)

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(ii) In 1610, the geocentric model of the Solar System was commonly accepted.

Explain how Galileo's observations contradicted the geocentric model.

(3)

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Q7.

(a)   Our Sun is a star.

(i) The life cycle of a star has several stages.
The Sun is in its main sequence stage.

Complete the sentence by putting a cross (☒) in the box next to your answer.

The next stage in the life cycle of the Sun will be

(1)

☒ **A**   a nebula

☒ **B**   a red giant

☒ **C**   a white dwarf

☒ **D**   a black hole

(ii) Complete the sentence by putting a cross (☒) in the box next to your answer.
The galaxy which contains our Sun is called

(1)

☒ **A** Andromeda

☒ **B** Orion

☒ **C** the Milky Way

☒ **D** the Solar System

(iii) Which of these is furthest from the Sun?
Put a cross (☒) in the box next to your answer.

(1)

☒ **A** Earth

☒ **B** The Moon

☒ **C** The planet Jupiter

☒ **D** The star Proxima Centauri

(b) Scientists search for signs of life on the planet Mars.
Describe **one** method they use to search for signs of life on the planet Mars.

(2)

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(c) Scientists search for new planets orbiting distant stars.
The photograph shows the Kepler space telescope.

The Kepler space telescope records the brightness of light from distant stars.
When a planet passes in front of a distant star, there is a tiny dip in the brightness of the light from the star.

(i) Many telescopes are used on the Earth but the Kepler space telescope orbits above the Earth's atmosphere.

Explain why telescopes that search for planets are not on the Earth's surface.

(2)

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(ii) The Kepler space telescope was pointed towards one star.
It detected the same dip in the brightness of the star every 150 days.

Suggest what information this gives about the planet that orbits this star.

(1)

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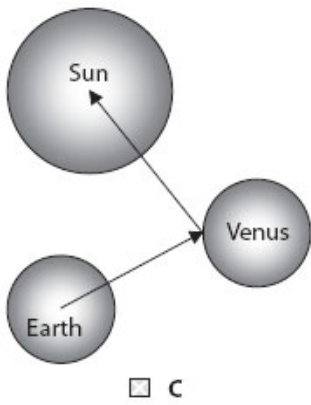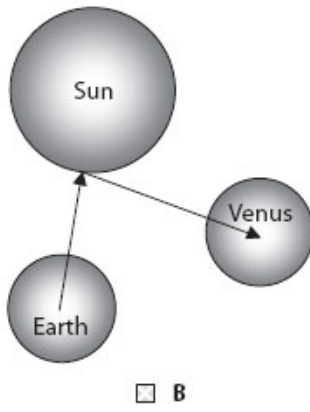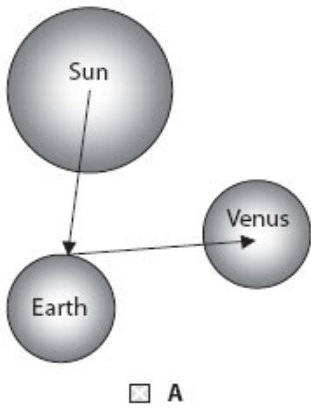
(Total for Question = 8 marks)

Q8.

(a) Galileo was one of the first scientists to use a telescope to study Venus.

(i) Which of these diagrams best shows how light waves enable us to see Venus?

   Put a cross (☒) in the box next to your answer.

(1)

Not to scale

□ A   □ B

□ C   □ D
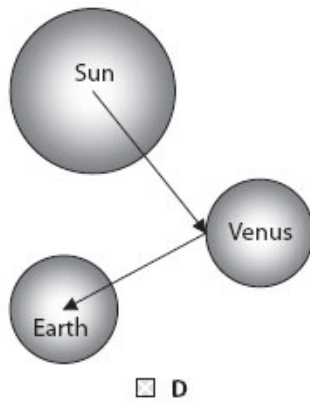
(ii) Use words from the box to complete the sentences.

(2)

asteroids	comets	geocentric	heliocentric
moons	particle	stars	

Galileo also used his telescope to observe the ………………… of Jupiter.

His observations provided evidence to support the ………………… model of the Solar System.

(iii) Describe how a reflecting telescope is different from the simple telescope which Galileo used.

(2)

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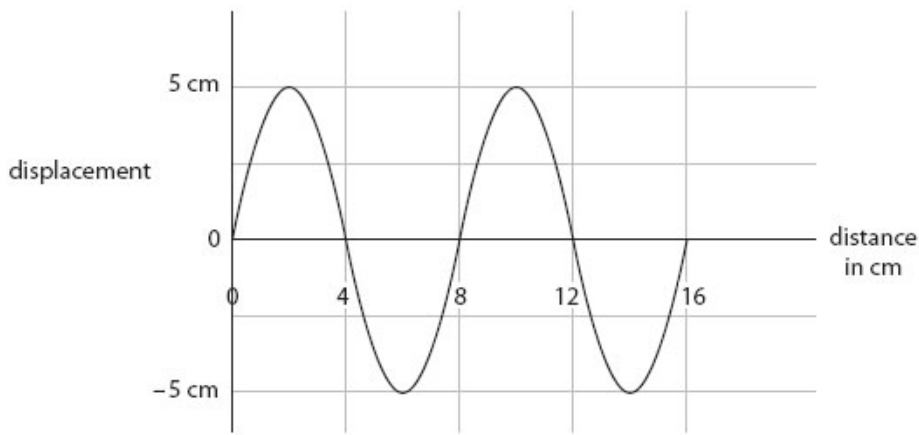..

(b) (i) The diagram represents a wave.

State the amplitude and wavelength of the wave.

(2)

amplitude of the wave = ... cm

wavelength of the wave = ... cm

(ii) 20 waves are sent out in 4 seconds.

Complete the sentence by putting a cross (☒) in the box next to your answer.
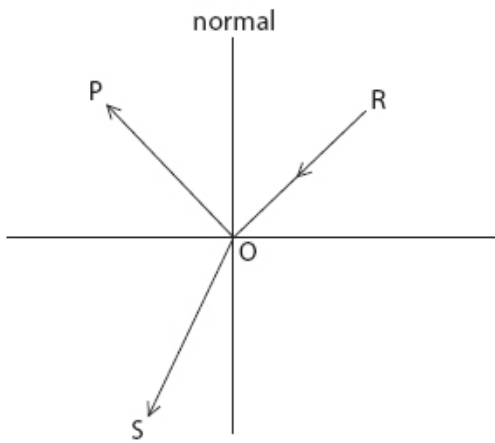
The frequency of the wave is

(1)

☒　**A**　0.2 Hz

☒　**B**　　5 Hz

☒　**C**　20 Hz

☒　**D**　80 Hz

(Total for Question is 8 marks)

Q9.

When light strikes a glass surface it can be both refracted and reflected.

(a) The diagram shows the possible paths for a ray of light which strikes a surface at the point O.
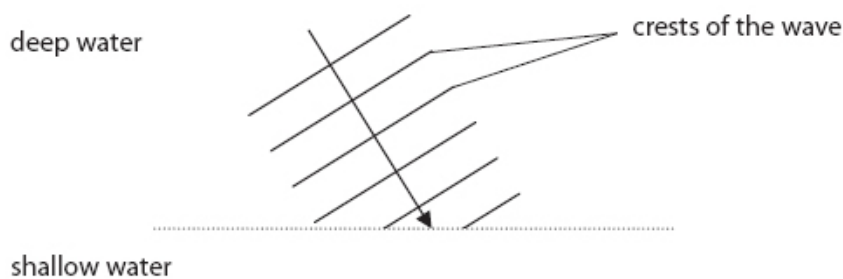
(i) Which of the lines show the possible path of a ray of light passing from air into glass?

Put a cross (☒) in the box next to your answer.

(1)

☒ **A** POS

☒ **B** POR

☒ **C** ROP

☒ **D** ROS

(ii) The diagram shows a water wave going from deep water into an area of much shallower water. The wave is refracted at the   boundary between deep water and shallow water.

Which row of the table is correct for what happens when the wave is refracted?

Put a cross (☒) in the box next to your answer.

(1)

	speed	direction
☒ A	stays the same	changes
☒ B	stays the same	stays the same
☒ C	changes	changes
☒ D	changes	stays the same

(b) In 1610 Galileo used a refracting telescope to observe the planet Jupiter..

(i) Explain how a refracting telescope produces a magnified image of Jupiter.

(3)

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(ii) In 1610, the geocentric model of the Solar System was commonly accepted.

Explain how Galileo's observations contradicted the geocentric model.

(3)

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(c) Light travels the 150 million km from the Sun to the Earth in about 500 s.
It takes about 2100 s for light to reach the Earth from Jupiter.
Using this information, calculate the approximate distance of Jupiter from the Earth.

(2)

distance of Jupiter from the Earth =....................million km

(Total for Question = 10 marks)