Name: _____

Stars

GCSE Stars

Date:

Time:

Total marks available:

Total marks achieved: _____

Questions

Q1.

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

Which of these is the biggest?

(1)

☒ **A** the Solar System

☒ **B** a galaxy

☒ **C** a nebula

☒ **D** the Universe

Q2.

The Sun is at the centre of our Solar System.

(i) Complete the following sentence.

(1)

Our Solar System is near the edge of a galaxy called the.....

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

When the Sun nears the end of its life it will become a

(1)

☒ **A** black hole

☒ **B** neutron star

☒ **C** supernova

☒ **D** white dwarf

Q3.

These are four stages in the evolution of a star similar to the Sun.

They are **not** in the correct order.

1. main sequence star
2. white dwarf
3. red giant
4. nebula

Write down the stages in the correct order.

(2)

The first stage has been done for you.

..... nebula .....

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Q4.

Our Sun is a main sequence star.
It will stay as a main sequence star for millions of years, continuing to radiate energy.

(i) Our Sun was formed from a nebula.

Describe the formation of our Sun from nebula to main sequence.

(2)

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(ii) Our Sun will go through many stages.

Which of these stages will our Sun go through?

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

(1)

☒ **A** a black hole

☒ **B** a neutron star

☒ **C** a supernova

☒ **D** a white dwarf

Q5.

During the twentieth century red-shift and CMB radiation were discovered.

They have provided scientists with data to test theories of the origin of the Universe.

Stars have different stages in their evolution.

(i) Which of these gives the next stages in the evolution of the Sun?

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

(1)

☒ **A** white dwarf then black hole

☒ **B** neutron star then white dwarf

☒ **C** red giant then supernova

☒ **D** red giant then white dwarf

(ii) Modern telescopes can provide us with more data than the telescopes used 100 years ago. Explain what additional data can be collected and processed using modern telescopes.

(2)

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Q6.

Scientists have studied stars to discover how stars evolve.

They know that stars form in a nebula when clouds of dust and gas are pulled together by

gravity.

Describe how this process continues for stars much more massive than the Sun.

(4)

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Q7.

During the twentieth century red-shift and CMB radiation were discovered.

They have provided scientists with data to test theories of the origin of the Universe.

(a) (i) Complete the following sentence.

(1)

.CMB is an abbreviation for.....

(ii) State which theory about the origin of the Universe is supported by the existence of CMB.

(1)

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(iii) There is a red-shift in the light received from some galaxies.
State what is meant by red-shift.

(1)

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(iv) Some galaxies show greater red-shift than others.
Explain what this suggests about the Universe.

(2)

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(b) Stars have different stages in their evolution.

(i) Which of these gives the next stages in the evolution of the Sun?

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

(1)

☒ **A** white dwarf then black hole

☒ **B** neutron star then white dwarf

☒ **C** red giant then supernova

☒ **D** red giant then white dwarf

(ii) Modern telescopes can provide us with more data than the telescopes used 100 years ago.
Explain what additional data can be collected and processed using modern telescopes.

(2)

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(Total for Question = 8 marks)

Q8.

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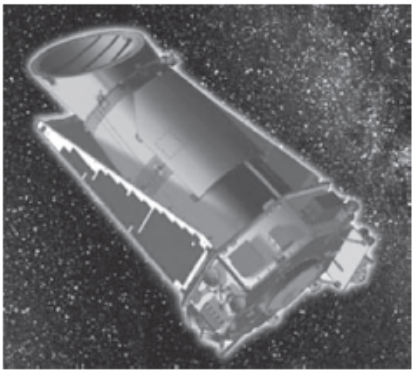
(c) Scientists search for new planets orbiting distant stars.
The photograph shows the Kepler space telescope.



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)

Q9.

(a) The Sun is at the centre of our Solar System.

(i) Complete the following sentence.

(1)

Our Solar System is near the edge of a galaxy called the.....

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

When the Sun nears the end of its life it will become a

(1)

☒ **A** black hole

☒ **B** neutron star

☒ **C** supernova

☒ **D** white dwarf

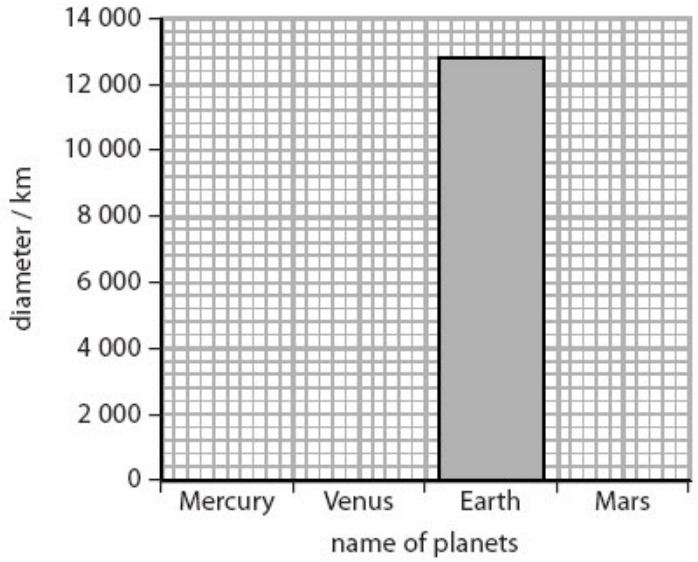
(b) The table gives information about the diameters and distances of the four planets closest to the Sun.

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

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*(c) For many years scientists have searched for evidence of intelligent life in our Solar System and in the rest of the Universe.

Describe the methods scientists have used to help with this search in both our Solar System and the rest of the Universe.

(6)

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(Total for Question = 12 marks)

Q10.

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

Which of these is the biggest?

(1)

☒ **A** the Solar System

☒ **B** a galaxy

☒ **C** a nebula

☒ **D** the Universe

(b) These are four stages in the evolution of a star similar to the Sun.

They are **not** in the correct order.

1. main sequence star
2. white dwarf
3. red giant
4. nebula

Write down the stages in the correct order.

(2)

The first stage has been done for you.

..... nebula .....

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(c) (i) The chart shows the electromagnetic (EM) spectrum.
Some parts of the spectrum have been labelled.

radio	**P**	**Q**	visible light	**R**	**S**	gamma rays

State the name of part **Q**.

(1)

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(ii) Three telescopes using different parts of the spectrum have been added to the chart.

radio	**P**	**Q**	visible light	**R**	**S**	gamma rays
Jodrell Bank			Hubble			Compton

Jodrell Bank is located near Manchester, whereas Hubble and Compton are in space.

Explain why some telescopes are located outside the Earth's atmosphere.

(2)

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*(d) Describe how modern telescopes have contributed to our understanding of the Universe.

(6)

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(Total for Question is 12 marks)

Q11.

A long time ago scientists thought that the Universe never changed.

Now there is evidence to show that stars progress through various stages and that the Universe is expanding.

(a) Our Sun is in its main sequence stage.

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

A star of much greater mass than the Sun will eventually become

(1)

☒ **A** a black hole

☒ **B** a protostar

☒ **C** a red dwarf

☒ **D** a white dwarf

(ii) Describe how the Sun reached its main sequence stage.

(3)

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(iii) Scientists can estimate the age of a star. They want to find the age of the oldest star.

Suggest why knowing the age of the oldest star is not enough to tell scientists the age of the Universe.

(2)

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*(b) Edwin Hubble discovered that the Universe was expanding.
He did this by using observations of red-shift.
Explain what red-shift is and how it provides evidence that the Universe is expanding.

(6)

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(Total for Question = 12 marks)