Practice Question Set For GCSE
Subject : Physics
Paper-1 Topic : 7_ Astronomy

Name of the Student:_____
Max. Marks : 19 Marks **Time : 19 Minutes**

Q1.

(i) A star with a mass very much larger than the Sun

(1)

- ☒ **A** has a longer main sequence than the Sun and ends as a white dwarf
- ☒ **B** has a longer main sequence than the Sun and ends as a black hole
- ☒ **C** has a shorter main sequence than the Sun and ends as a white dwarf
- ☒ **D** has a shorter main sequence than the Sun and ends as a black hole

(ii) Which row has two correct statements about black holes?

(1)

	the gravitational field of a black hole	a black hole is formed when
☐ **A**	allows only electromagnetic radiation to escape	a nebula collapses
☐ **B**	allows nothing to escape	a very large star collapses
☐ **C**	allows nothing to escape	a nebula collapses
☐ **D**	allows only electromagnetic radiation to escape	a very large star collapses

(Total for question = 2 marks)

Q2.

Figure 4 is a diagram giving some information about main sequence stars.
Luminosity is a measure of how bright something is.
An increase in luminosity means an increase in brightness.

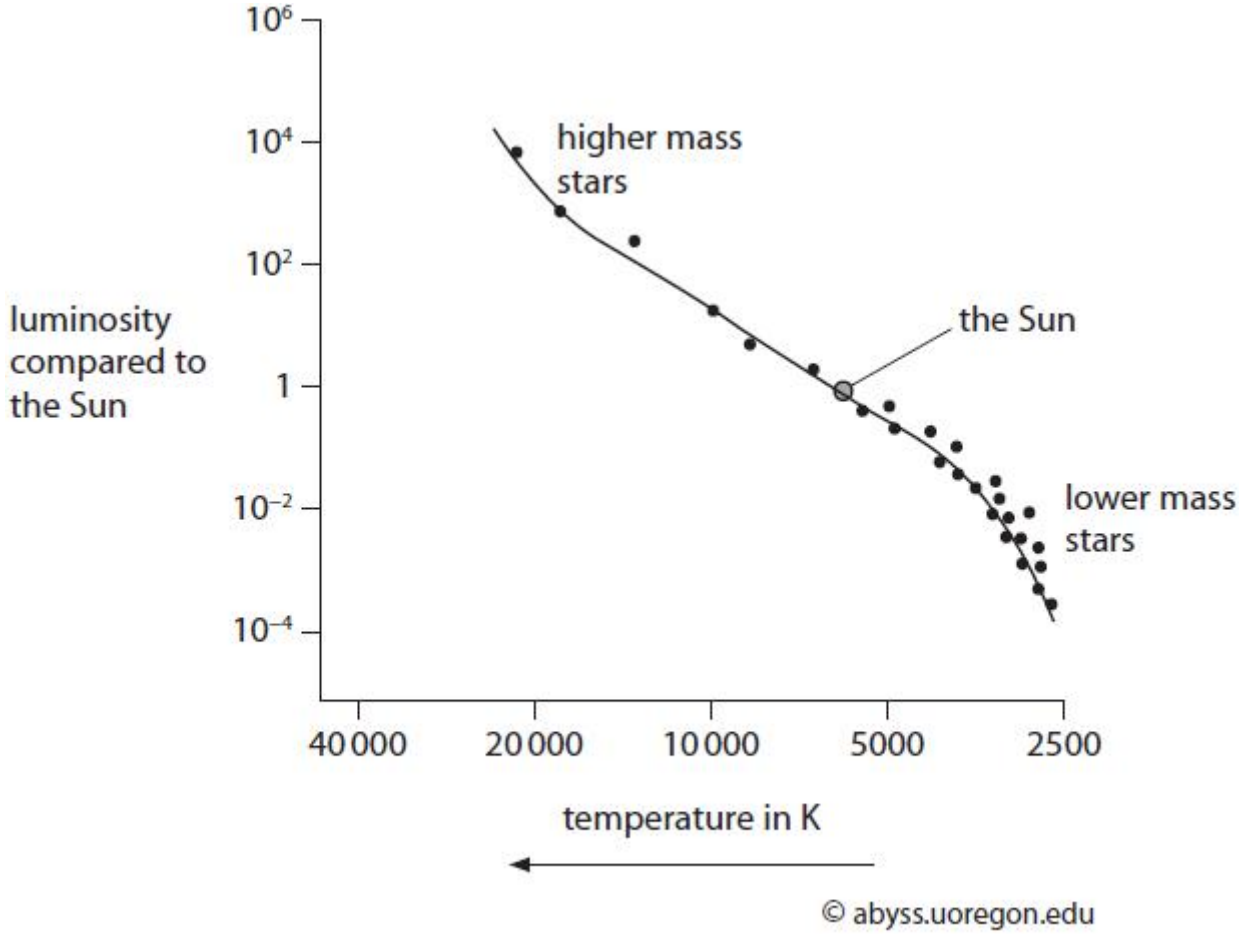

Figure 4

(i) Estimate the temperature of the Sun.

(1)

temperature of the Sun = ... K

(ii) State how the brightness of a main sequence star changes with its temperature.

(1)

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(iii) State how the brightness of a main sequence star changes with its mass.

(1)

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(Total for question = 3 marks)

Q3.

The Big Bang theory is one theory for the origin of the Universe.

The Big Bang theory suggests:

- the Universe had a beginning
- the Universe is still expanding.

Observations of the expanding Universe have shown that the further away a galaxy is from the Earth, the faster the galaxy is moving away from the Earth.

Figure 4 shows how the velocity of galaxies is related to their distance from the Earth.

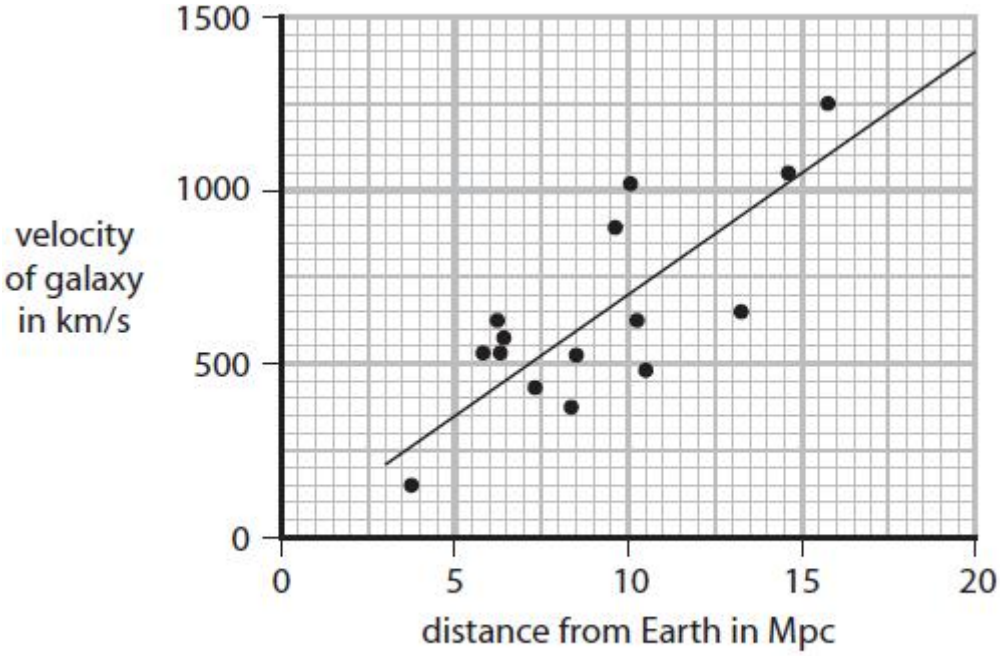

Figure 4

Mpc is a unit of distance used for large distances in space.

(i) Use Figure 4 to estimate the velocity of a galaxy that is 15 Mpc away from the Earth.

(1)

velocity = ... km/s

(ii) Calculate the gradient of the line shown in Figure 4.

State the unit.

(3)

gradient = ... unit .....

(iii) The gradient of the line in Figure 4 can be used to estimate the age of the Universe.

Explain why the gradient of the line in Figure 4 can only provide an **estimate** of the age of the Universe.

(2)

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(Total for question = 6 marks)

Q4.

Answer the question with a cross in the box you think is correct ☒ . If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☒ .

The Big Bang theory is one theory for the origin of the Universe.

The Big Bang theory suggests:

- the Universe had a beginning
- the Universe is still expanding.

Which of these provides evidence that the Universe had a beginning?

(1)

☐ **A** the discovery of other galaxies

☐ **B** the discovery of the moons of Jupiter

☐ **C** the discovery of planets orbiting distant stars

☐ **D** the discovery of cosmic microwave background (CMB) radiation

(Total for question = 1 mark)

Q5.

Figure 1 shows the spectrum of an element detected in the light from a distant galaxy, from a nearby galaxy and from a source on Earth.

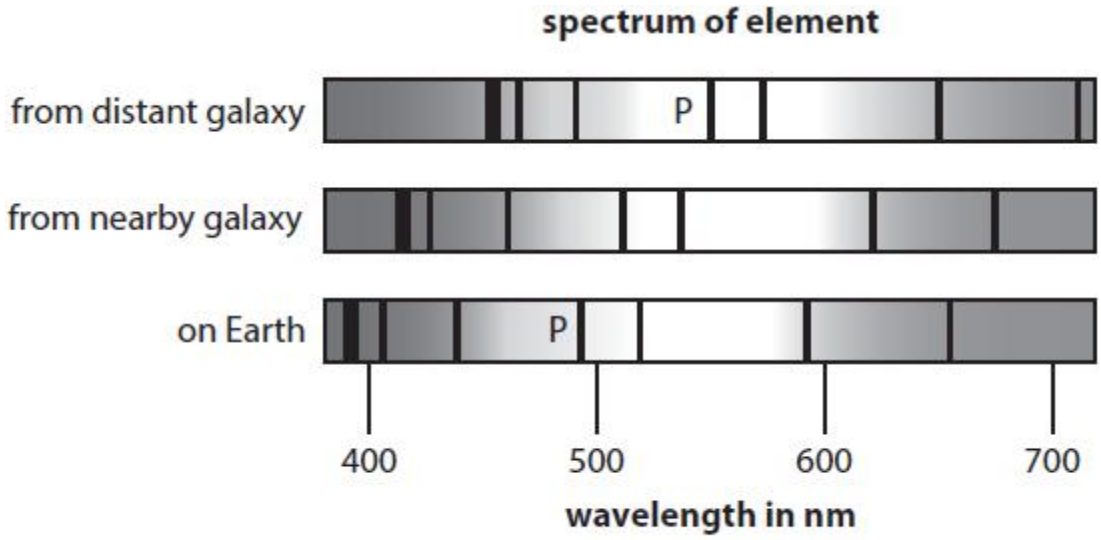

Figure 1

(i) Estimate the difference between the wavelength of line P in the spectrum from the distant galaxy and the wavelength of line P in the spectrum on Earth.

(1)

difference in wavelength = ... nm

(ii) Scientists have discovered that light from almost all distant galaxies has spectral lines shifted towards the red end of the spectrum.

Explain how red shift in light, received from galaxies at different distances from the Earth, supports the idea that the Universe is expanding.

(3)

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(Total for question = 4 marks)

Q6.

A nebula may evolve into a main sequence star, such as the Sun.

Explain how a nebula may evolve into a main sequence star.

(3)

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(Total for question = 3 marks)