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

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Name of the Student:_____
Max. Marks : 22 Marks **Time : 22 Minutes**

Q1.

Figure 6 shows two objects, **E** and **D**.

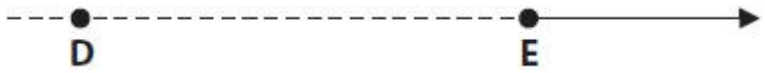

Figure 6

E emits a sound.

D detects the sound.

E emits a sound of wavelength 1.86 m.

D measures the wavelength of this sound as 1.98 m.

(i) Calculate the difference between the wavelength that **E** emits and the wavelength that **D** detects.

(1)

difference in wavelength = ... m

(ii) The velocity of sound is 330 m / s.

Calculate the velocity of **E**.

(2)

Use the equation

$$\text{velocity of } \mathbf{E} = \frac{\text{velocity of sound} \times \text{difference in wavelength}}{\text{wavelength } \mathbf{E} \text{ emits}}$$

velocity of **E** = ... m/s

(Total for question = 3 marks)

Q2.

The table shows some data about the Earth's orbit of the Sun.

orbital radius (R)	1.5×10^8 km
time for one orbit (T)	3.2×10^7 s

Use the following equation to calculate the orbital speed, *v*, of the Earth.

$$v = \frac{2 \times \pi \times R}{T}$$

(3)

v = ... m/s

(Total for question = 3 marks)

Q3.

The Sun has a mass of 2.0×10^{30} kg.
A white dwarf has a mass of 3.4×10^{29} kg.

Calculate the value of

$$\frac{\text{mass of this white dwarf}}{\text{mass of the Sun}}$$

(2)

value = ...

(Total for question = 2 marks)

Q4.

The Asteroid Belt is part of our Solar System.

Vesta is an asteroid in the Asteroid Belt.

Vesta has an orbital speed of 1.9×10^4 m/s.

Vesta travels a distance of 2.2×10^{12} m when it orbits the Sun once.

Calculate the time taken for Vesta to orbit the Sun once.

(2)

time = ... s

(Total for question = 2 marks)

Q5.

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)