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

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Name of the Student:_____
Max. Marks : 20 Marks **Time : 20 Minutes**

Q1.

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)

.....

.....

.....

.....

(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

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Q2.

CMB radiation provides evidence that the Universe had a definite beginning.

Use the table in Figure 7 to give a typical value for the wavelength of CMB radiation.

type of radiation	typical wavelength
gamma rays	1.0×10^{-12} m
X-rays	3.0×10^{-11} m
ultraviolet	200 nm
visible	600 nm
infrared	4.0 μm
microwaves	1.0 mm
radio waves	50 m

Figure 7

(2)

wavelength = ...

(Total for question = 2 marks)

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Q3.

Figure 3 shows a photograph of galaxy D.

This photograph was taken by a student at his home.

(Source: Paul Curtis)

Figure 3

State **two** ways that the student can improve the observational techniques so that the quality of the image is improved.

(2)

1 .....

.....

2 .....

.....

(Total for question = 2 marks)

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Q4.

During the evolution of a star, the nebula collapses and becomes a main sequence star.

(i) State what causes the nebula to collapse.

(1)

.....

(ii) Explain why the nebula stops collapsing as it becomes a main sequence star.

(3)

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(Total for question = 4 marks)

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Q5.

Two theories about the Universe are the Steady State Theory and The Big Bang Theory.

(i) The table shows some ideas about the Universe.

Which row of the table applies to the Steady State Theory?
Put a cross (☒) in the box next to your answer.

(1)

	the Universe.....	the Universe.....
☐ **A**	... is not expanding	... had a beginning
☐ **B**	... is expanding	... had a beginning
☐ **C**	... is not expanding	... did not have a beginning
☐ **D**	... is expanding	... did not have a beginning

(ii) State the name of the discovery that persuaded most scientists to prefer the Big Bang Theory to the Steady State Theory.

(1)

.....

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Q6.

Figure 2 shows some lines in the absorption spectra from four different galaxies (A, B, C, and D) and from a laboratory source.

All the spectra are aligned and to the same scale.

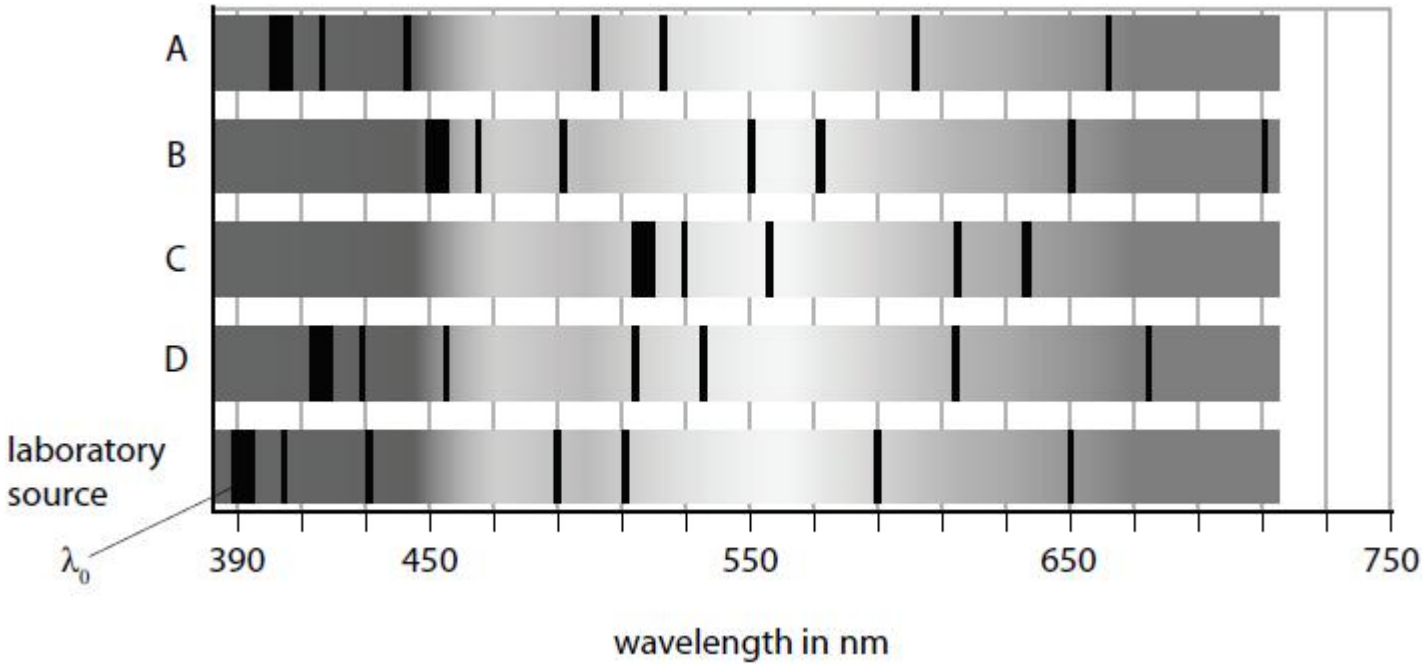

Figure 2

(i) Explain, using Figure 2, which galaxy is furthest away from us.

(3)

.....

.....

.....

.....

.....

.....

(ii) In Figure 2, the reference wavelength, λ_0, is shown at 390 nm.

Estimate the change in the reference wavelength, $\Delta\lambda$, for the light from galaxy D.

(1)

$\Delta\lambda$ = ... nm

(iii) Calculate the speed, *v*, of galaxy D.

Use the equation

$$v = c\frac{\Delta\lambda}{\lambda_0}$$

[c = speed of light = 3×10^8 m/s]

(2)

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v = ... m/s

(Total for question = 6 marks)

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Q7.

A star has evolved to become a neutron star.

The mass, M, of the neutron star, of radius R, is given by

$$M = \frac{4 \times \pi \times D \times R^3}{3}$$

where D is a constant

$M = 4 \times 10^{30}$ kg

$D = 6 \times 10^{17}$ kg/m^3

Use the equation to calculate the value for R.

(2)

R = ... m

(Total for question = 2 marks)

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