

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

**Name of the Student:** \_\_\_\_\_

**Max. Marks : 23 Marks**

**Time : 23 Minutes**

Q1.

Satellites are used to gather data about the origin of the Universe.

The Big Bang theory is a theory about the origin of the Universe.

Evidence for the Big Bang theory is provided by red-shift and CMB radiation.

(i) Describe what is meant by red-shift.

(2)

.....

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(ii) Explain how red-shift provides evidence for the Big Bang theory.

(2)

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(iii) The Cosmic Background Explorer (COBE) satellite observed CMB radiation from 1989 to 1993.

State what the 'M' in CMB radiation stands for.

(1)

.....

(iv) State what is meant by 'cosmic background radiation'.

(1)

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.....

(v) Explain how the presence of CMB radiation provides evidence for the Big Bang theory.

(2)

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**(Total for question = 8 marks)**

Q2.

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.

(i) Complete the following sentence.

(1)

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

(1)

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

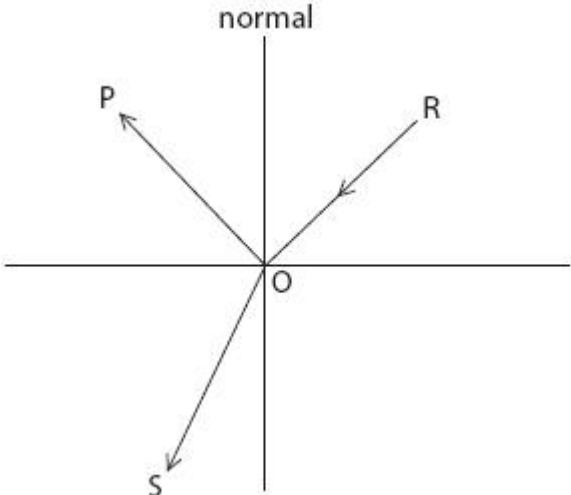
(1)

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

(2)

Q3.

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      |
|----------------------------|----------------|----------------|
| <input type="checkbox"/> A | stays the same | changes        |
| <input type="checkbox"/> B | stays the same | stays the same |
| <input type="checkbox"/> C | changes        | changes        |
| <input type="checkbox"/> 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)**