PRISM WORLD

Std.: 9 (English) **Science 2**

Chapter: 18

Q.1 **Fill in the blank and rewrite the completed statements** **5**

1 The biggest optical telescope in India is situated at ..... .

Ans The biggest optical telescope in India is situated at **Nainital**.

2 GMRT is used for ..... waves.

Ans GMRT is used for **Radio** waves.

3 The wavelength of Visible light rays is between ..... and ..... .

Ans The wavelength of Visible light rays is between **400 nm** and **800 nm**.

4 The first scientist to use a telescope for space observation was ..... .

Ans The first scientist to use a telescope for space observation was **Galileo**.

5 A certain X-ray telescope is named after scientist ..... .

Ans A certain X-ray telescope is named after scientist **Subramanian Chandrashekhar**.

Q.2 **Match the pair** **1**

1

Group A	Group B
i. X - rays	a. GMRT
ii. Optical telescope	b. ISRO
iii. Indian radio telescope	c. Hubble
iv. Launching artificial satellites	d. Chandra

Ans

i. X - rays	Chandra
ii. Optical telescope	Hubble
iii. Indian radio telescope	GMRT
iv. Launching artificial satellites	ISRO

Q.3 **Attempt the following.** **2**

1 Explain the construction of Galileo's telescope.

Ans i. Galileo made the telescope using spectacle makers glass.
ii. He placed two such lenses on the either end of a hollow cylindrical tube. He used trial and error method to achieve the proper placement of the lenses.

Q.4 **Give scientific reasons** **4**

1 X-ray telescope are not based on earth.

Ans i. X-ray telescopes are used detect the X-rays coming from a heavenly body.
ii. The earth's atmosphere blocks almost all the X-rays coming towards the surface of the earth.
iii. Due to this reason an X-ray telescope not based on earth.

2 Optical telescopes are located in uninhabited places on mountains.

Ans i. The visible light coming from the heavenly body has to pass through the earth's atmosphere to reach the earth surface.
ii. During this journey, some light is absorbed by the atmosphere and intensity of light decreases.
iii. The changes in atmospheric pressure and temperatures cause turbulence due to which the direction of light rays changes thereby changing the position of image.
iv. Due to theses reasons optical telescopes located in uninhibited places on mountains.

Q.5 **Answer the following** **3**

1 Explain the construction of a radio telescope.

Ans i. Many heavenly objects emit radio waves in addition to visible radiation. We cannot see this radiation with our eyes.
ii. A radio telescope is used to receive these rays.
iii. It is made up of one or more dishes of a particular parabolic shape.
iv. The radio waves incident on the dish are reflected and converged at the focus. A radio receiver is placed at the focus.
v. The information gathered by the receiver is passed on to a computer which analyses it and constructs an image of the source.

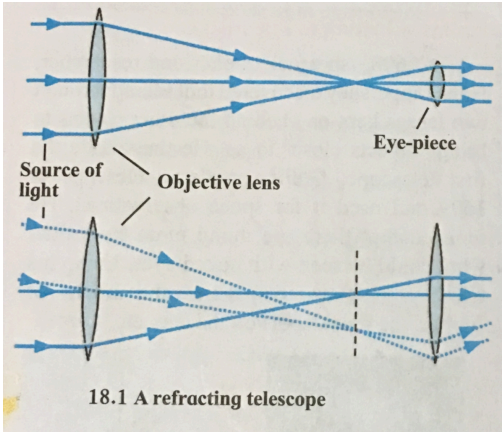
Q.6 **Answer the following in detail** **15**

1 What are the difficulties in using ground based optical telescopes? How are they overcome?

Ans i. The radiations coming from the heavenly body has to pass through the earth's atmosphere to reach the earth surface.
ii. During this journey, some radiations are absorbed by the atmosphere and intensity of light decreases.
iii. The changes in atmospheric pressure and temperatures cause turbulence due to which the direction of light rays changes thereby changing the position of image.
iv. During day due to sunlight and during night due to city lights we cannot use the telescope efficiently.
v. Changes in seasons or cloudy atmosphere also affects the image formed by the telescope.
These difficulties are overcome by the following ways:
a. The optical telescopes should be located in uninhabited places on mountains.
b. The best way to overcome all the above difficulties is to place the telescope in space.

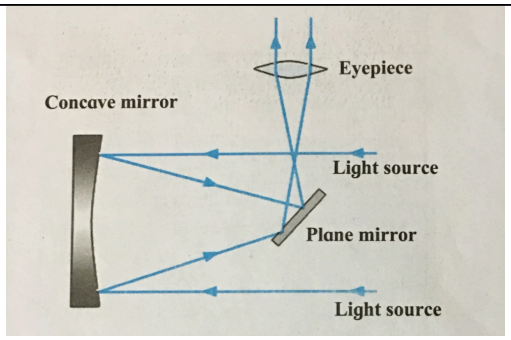
2 Which type of telescope can be made using a concave mirror, convex mirror, plane mirror and a lens? Draw diagrams of these telescopes.

Ans We can make Refracting telescopes and Reflecting telescopes by using a concave mirror, convex mirror, plane mirror and a lens.
Refracting telescopes: The telescopes made with two or more lenses are called refracting telescopes. These telescopes consists of an objective lens and an eyepiece (lens).

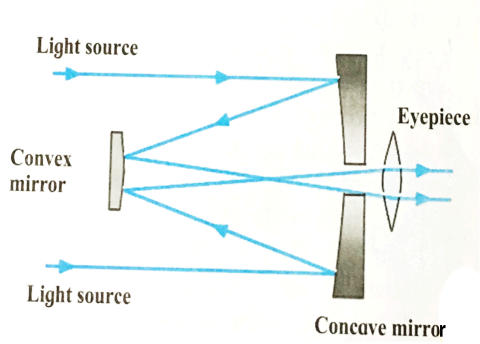


18.1 A refracting telescope

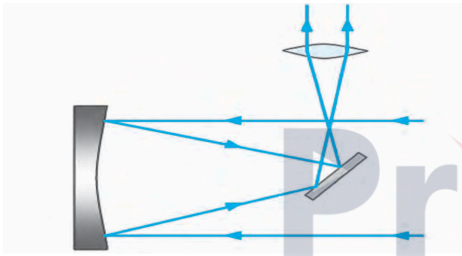
Reflecting telescopes: These telescopes are of two types.
i. Newtonian telescope: The Newtonian telescopes is a reflecting telescope made with a concave mirrors, plane mirror and an eyepiece(lens).



ii. Cassegrain telescope: The Cassegrain telescopes is a reflecting telescope made with a concave mirrors, convex mirror and an eyepiece(lens).

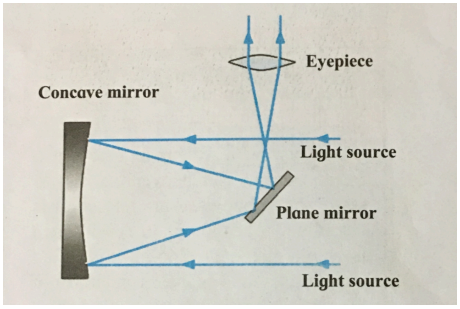


3 Study the figure and answer the following questions.



i. What type of telescope is shown in the figure?
ii. What other type of telescope uses a curved mirror?
iii. Label the main parts of the telescope.
iv. Which type of mirror does the telescope use?

Ans i. The figure shows a Newtonian telescope.
ii. Newtonian and Cassegrain telescope also uses curved mirrors.
iii.



iv. The telescope uses a Concave mirror and a plane mirror.