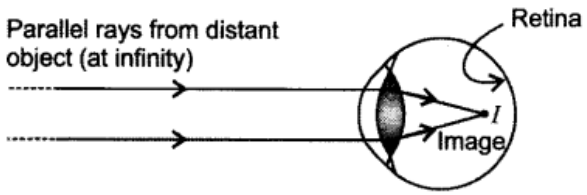
INDIAN SCHOOL MUSCAT
DEPARTMENT OF PHYSICS
REVISION WORKSHEET 2
CLASS 10
HUMAN EYE AND COLOURFUL WORLD

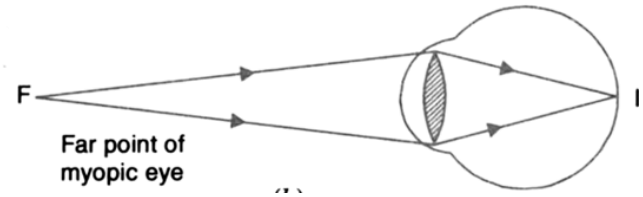
1 Why is red colour selected for danger signal lights?

Answer. Wavelength of red colour is more and so, it is least scattered. It can be easily seen through a large distance.

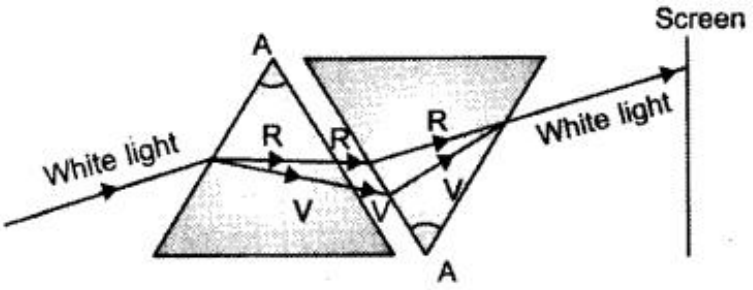
2 Student sitting at the back bench in a class is not able to see what is written on the blackboard. He however, sees it clearly when sitting on the front seat at an approximate distance of 1.5 m from the blackboard. Draw ray diagrams to illustrate the image formation of the blackboard when he is seated at the (i) back seat (ii) front seat. Answer. (i) When student is seated at the back seat.



(ii) When student is seated at front seat.

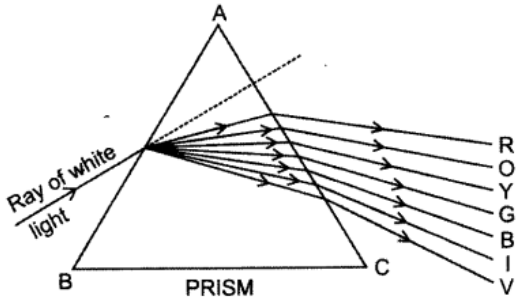


3 What is meant by spectrum of white light? How can we recombine the components of white light after a prism has separated them? Draw a diagram to illustrate it. Answer. The coloured pattern VIBGYOR formed by a prism by splitting the incident white light is called a spectrum. By having two identical prisms, inverted to each other, one can recombine the light to get white light again.



4 What is dispersion of white light? What is the cause of such dispersion? Draw a diagram to show the dispersion of white light by a glass prism.
(b) A glass prism is able to produce a spectrum when white light passes through it but a glass slab does not produce any spectrum. Explain why is it so?

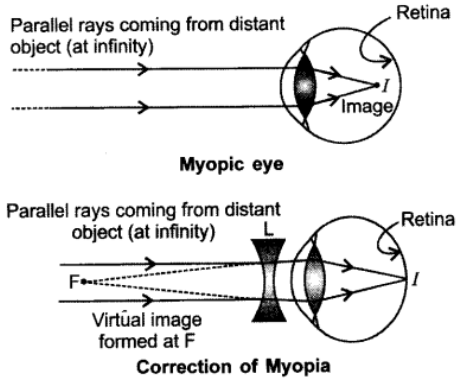
Answer: The splitting up of white light in to its constituent colours when passed through a prism is called dispersion.



(b) In the glass slab has opposite sides are parallel but in prism the opposite sides are at some angle.

5 What is myopia (near-sightedness)? Draw a ray diagram to show how it can be corrected using a lens.

Answer. Myopia is the inability of an eye in viewing long distant objects. The image in this case is formed before the retina. For every myopic eye, there exists a far point beyond which clear image cannot be seen.
The short-sightedness is corrected by using a concave lens which diverges and shifts the image to the retina.



6 (a) What is meant by the power of accommodation of an eye?
(b) A person with a myopic eye cannot see objects beyond 1.2 m directly. What should be the type of the corrective lens used? What would be its power?
Answer. (a) The maximum variation in power of the lens so that the far-off and nearby objects are viewed clearly is called power of accommodation.
(b) To correct, an object at infinity has to be brought as an image to 120 cm.

$$\therefore \quad \frac{1}{f} = \frac{1}{-120} - \frac{1}{(-\infty)} = \frac{1}{-120}$$

$$\Rightarrow \quad f = -120 \text{ cm}$$

$$P = \frac{100}{-120} = \frac{-5}{6} D$$

$$= -0.83 \text{ D}$$

A concave lens of focal length 120 cm and power – 0.83 D is to be used.

7 State the functions of (i)iris (ii)ciliary muscles (iiii) pupil
(i) Iris controls the size of pupil. (ii) Ciliary muscles help the eye lens to focus the image of an object on the retina by increasing or decreasing the curvature of eye lens.(iii) Pupil regulates and controls the amount of light entering the eye.

8 What is the colour of the clear sky during day time? Give reason for it.

Answer. Clear sky appears blue.
Reason: When sunlight passes through the atmosphere having the molecules of air and other fine particles, whose size is smaller than the wavelength of visible light, these molecules and particles scatter the blue colour more strongly than the other coloursof as the wavelength of blue colour is more. This scattered blue light enters our eye. So, the colour of sky appears blue to us during day time.