



# PHYSICS

**BOOKS - VK GLOBAL PUBLICATION**

**PHYSICS (HINGLISH)**

**THE HUMAN EYE AND THE  
COLOURFUL WORLD**

**Ncert Intext Questions**

1. What is meant by power of accommodation of the eye?



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2. A person with a myopic eye cannot see objects beyond 1.2 m distinctly. What should be the type of the corrective lens used to restore proper vision?



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3. What is the far point and near point of the human eye with normal vision?



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4. A student has difficulty in reading the blackboard while sitting in the last row. What could be the defect the child is suffering from? How can it be corrected?



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1. The human eye can focus objects at different distances by adjusting the focal length of the eye lens. This is due to

- A. presbyopia
- B. accommodation
- C. near-sightedness
- D. far-sightedness

**Answer: B**

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2. The human eye forms the image of an object at its

A. cornea

B. iris

C. pupil

D. retina

**Answer: D**



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3. The least distance of distinct vision for a young adult with normal vision is about

A. 25 m

B. 2.5 cm

C. 25 cm

D. 2.5 m

**Answer: C**



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4. The change in focal length of an eye lens is caused by the action of the

A. pupil

B. retina

C. ciliary muscles

D. iris

**Answer: C**



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5. A person needs a lens of power  $-5.5$  diopters for correcting his distant vision. For correcting his near vision he needs a lens of power  $+1.5$  diopter. What is the focal length of the lens required for correcting (i) distant vision, and (ii) near vision?



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6. The far point of a myopic person is  $80$  cm in front of the eye. What is the nature and power



of the lens required to correct the problem?



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7. Make a diagram to show how hypermetropia is corrected. The near point of a hypermetropic eye is 1 m. What is the power of the lens required to correct this defect? Assume that the near point of the normal eye is 25 cm.



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8. Why is a normal eye not able to see clearly the objects placed closer than 25 cm?



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9. What happens to the image distance in the eye when we increase the distance of an object from the eye?



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10. Why do stars twinkle?



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11. Explain why the planets do not twinkle.



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12. Why does the sun appear reddish early in the morning?



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13. Why does the sky appear dark instead of blue to an astronaut?



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## Very Short Answer Questions

1. The ciliary muscles of a normal eye are in their (i) most relaxed (ii) most contracted

state. In which of the two cases is the focal length of the eye-lens more?



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2. Write in one word or at the most in one sentence about the following

(i) Mirrors used by dentists to examine teeth.

(ii) The smallest distance, at which the eye can see objects clearly without strain.



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3. Which defect of the eye can be corrected by using a cylindrical lens?

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4. A person is advised to wear spectacles with concave lenses. What type of defect of vision is he suffering from?

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5. A person is advised to wear spectacles with convex lenses. What type of defect of vision is he suffering from?



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6. What is colour blindness?



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7. When a monochromatic light having only one wavelength, passes through a prism, will it show dispersion?



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8. What do you understand by spectrum of white light?



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9. The sun can be seen about two minutes before actual sunrise. Give reason.



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10. Name the component of white light that deviates the least and the component that deviates the most while passing through a glass prism.



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11. Why does the sky appear dark to astronauts?



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## Short Answer Questions I

1. How do we see colours?



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2. What is colour-blindness? What kind of retinal cells are lacking in person suffering from this defect?



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3. Why there is no dispersion of light refracted through a rectangular glass slab?



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4. Why are 'danger' signal lights red in colour?



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5. What is meant by dispersion of white light?

Name the various colours of spectrum of white light in proper sequence.



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6. What is the cause of dispersion?



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7. Why do different rays deviate differently in the prism?



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8. How will you use two identical prisms so that a narrow beam of white light incident on one prism emerges out of the second prism as white light?





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## Short Answer Questions li

1. (a) Name the four parts labelled as 1, 2, 3 and 4 in the given diagram. (b) At which place is the image of an object formed?



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2. What is presbyopia? What causes presbyopia? How is presbyopia corrected?



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3. What is astigmatism? What causes astigmatism? How is astigmatism corrected?



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4. What is meant by 'persistence of vision'? We are able to see the movie picture in a cinema hall, How does this happen?



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5. What is meant by scattering of light? Use this phenomenon to explain why the clear sky appears blue or the sun appears reddish at sunrise.



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6. Why does it take sometime to see objects in a dim room when you enter the room from bright sunlight outside?



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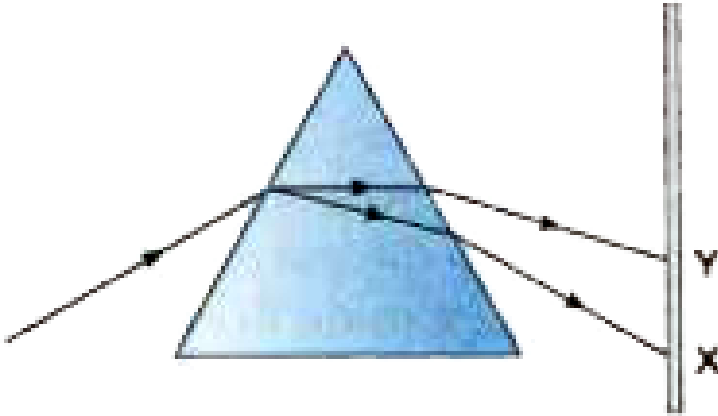


7. In the given figure, a narrow beam of white light is shown to pass through a triangular glass prism. After passing through the prism it produces a spectrum XY on a screen.

(a) State the colour seen at X and Y.

(b) Why do different colours of white light bend through different angles with respect to

the incident beam of light?



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8. Explain giving reason why the sky appears blue to an observer from the surface of the Earth. What should the appearance of the sky be during the day for an astronaut staying in

the international space station orbiting the Earth? State reason to justify your answer.



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9. Why is the colour of sky blue?



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10. What is Tyndall effect? Explain with an example.



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**11.** Describe the formation of rainbow in the sky with the help of a diagram.



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**12.** How does atmospheric refraction affect sunrise and sunset?



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**13.** What is meant by advance sunrise and delayed sunset. Draw a labelled diagram to explain.



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**14.** A person needs a lens of power - 4.5 D for correction of her vision.

(a) What kind of defect in vision is she suffering from?

(b) What is the focal length of the corrective

lens?

(c) What is the nature of the corrective lens?



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**15.** How are we able to see nearby and also the distant objects clearly?



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**Long Answer Questions**

1. State the function of each of the following parts of the human eye:

(i) Cornea (ii) Iris

(iii) Pupil (iv) Retina

Millions of people of the developing countries are suffering from corneal blindness. This disease can be cured by replacing the defective cornea with the cornea of a donated eye. Your school has organised a campaign in the school and its neighbourhood in order to create awareness about this fact and motivate people to donate their eyes after death. How

can you along with your classmates contribute in this noble cause? State the objectives of organising such campaigns in schools.



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2. What is hypermetropia? Write two causes for development of this defect. Describe with a ray diagram how this defect of vision can be corrected by using spectacles.



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3. (a) What is myopia? State the two causes of myopia. With the help of labelled ray diagrams show

(i) the eye defect myopia

(ii) correction of myopia using a lens.

(b) Why is the normal eye unable to focus on an object placed within 10 cm from the eye?



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4. (a) What is dispersion of white light? What is the cause of 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 it is so.



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5. With the help of an activity show the blue colour of the sky and the reddish appearance of the sun at the sunrise or sunset.



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## Some Important Questions

1. A person cannot see objects nearer than 75 cm from his eyes while a person with normal vision can see objects upto 25 cm from his eyes. Find the nature, the focal length and the power of the correcting lens used for the defective vision.



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2. A person cannot see objects beyond 80 cm from his eye while a person with normal eyesight can see object easily placed upto 160 cm from the eye. Find the nature, the focal length and the power of the correcting lens.



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3. A person can see clearly only up to 3 metres. Prescribe a lens for spectacles so that he can see clearly up to 12 metres.





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## Hots Higher Order Thinking Skills

1. Is the position of a star as seen by us in its true position? Justify your answer.



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2. Does a beam of white light give a spectrum on passing through a hollow prism?



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3. A beam of white light falling on a glass prism gets split up into seven colours marked 1 to 7 as shown in the diagram.

A student makes the following statements about the spectrum observed on the screen.

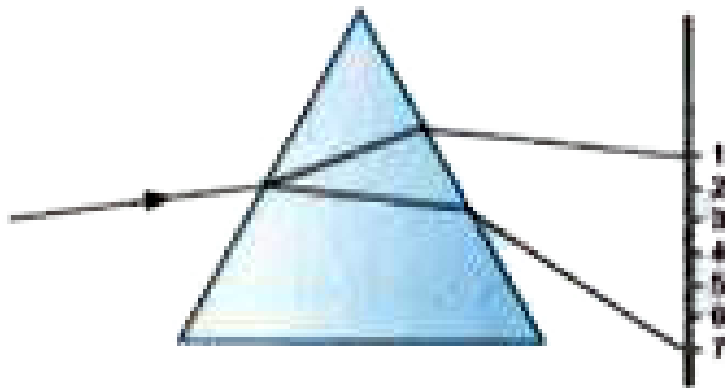
(a) The colours at positions marked 3 and 5 are similar to the colour of the sky and the colour of gold metal respectively.

Is the above statement made by the student correct or incorrect? Justify.

(b) Which two positions correspond closely to

the colour of

(i) brinjal, (ii) 'danger' or stop signal lights?



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4. Why sometimes haloes or rings are observed round the moon or sun?

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5. Can an observer see a rainbow on the moon?



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6. Why does a person suffering from hypermetropia prefer to remove his spectacles while looking at distant objects? Explain.



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## Proficiency Exercise Short Answer Questions I

1. A person is unable to see objects nearer than 50 cm. He wants to read a book placed at a distance of 25cm. Find the nature, focal length and power of the lens, he requires for his spectacles.



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2. A person with a myopic eye cannot see objects beyond a distance of 1.5 m from it.

What would be the nature and power of the corrective lens used to restore proper vision?



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