PHYSICS

BOOKS - KUMAR PRAKASHAN

THE HUMAN EYE AND THE COLOURFUL WORLD

Questions And Answers

1. What is the human eye ? On which phenomenon does it work?

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2. With a neat labelled diagram, explain the functions of the main parts of the human eye.

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3. Draw a neat labelled diagram of the human eye and explain the working of each part of it.

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4. With a neat labelled diagram, explain the structure and functioning of the human eye.

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5. Which type of changes occur in thickness or curvature of an eye lens which enables the eye to see the distant and nearby object clearly ?

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6. How is a normal eye able to see distinctly, distant as well as nearby objects ?

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7. Define the term 'Power of accommodation' of the human eye.

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8. What is accommodation power of the human eye ?

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9. What is the least distance of distinct vision ?

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10. What is the near point of the human eye ?

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11. What is the far point of the human eye?

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12. What are the values of (1) near point and (2) far point of the eye for a young adult with normal vision ?

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13. What is the range of vision for a normal human eye?

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14. What is cataract? How is the vision of a person having cataract restored ?

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15. Why do we have two eyes for vision and not just one ?

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16. Why has nature given us two eyes instead of one ?

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17. What are refractive defects of vision ? Why these defects arise ?

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18. Name the three main common refractive defects of vision.

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19. What is myopia or near-sightedness? What is the far point of a normal eye and a myopic eye?

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20. State causes of myopia. How is this defect corrected ? Draw suitable diagram to show it.

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21. What is hypermetropia or farsightedness? What is the near point of a normal eye and a hypermetropic eye ?

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22. State causes of hypermetropia. How can this defect be corrected ? Draw suitable diagram to show it.

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23. What is presbyopia ? State causes of presbyopia. How is this defect corrected ?

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24. Write a short note on Presbyopia

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

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

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28. 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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29. What is a prism ?

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30. What is a triangular glass prism?

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31. How many surfaces does a glass prism have ?

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32. What is the angle of a prism? What is its value in case of an equilateral triangular

prism?

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33. What is a spectrum ?

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34. What is dispersion of light?

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35. State the causes of dispersion of white light as it passes through a triangular glass prism.

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36. Why do we get different colours in the phenomenon of dispersion of white light through prism?

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37. Explain with appropriate diagram Newton's experiment showing that white light of the Sun (sunlight) is composed of seven colours.

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38. How did Newton show that white light of the Sun (sunlight) contains seven colours using two identical glass prisms?

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39. Describe the activity to show that the colours of white light splitted by a glass prism can be recombined to get white light by another identical glass prism. Also draw ray diagram to show the recombination of the spectrum of white light.

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40. Give an example of 'Natural Spectrum'. Explain the formation of a rainbow in sky with a neat labelled diagram.

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41. A rainbow is an example of dispersion of sunlight. Justify this statement by explaining, with a neat labelled diagram, the formation of a rainbow in the sky. List two essential conditions for observing a rainbow.

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42. What is atmospheric refraction ? Explain briefly.

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43. Write a note on twinkling of stars.

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44. Why do stars twinkle ? Explain in detail.

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45. Explain why the planets do not twinkle.

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46. Give the reason for the advanced sunrise and delayed sunset.

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47. The sun is seen two minutes earlier than the actual sunrise and the sun is seen for two minutes more even after the actual sunset. Why?

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48. What is scattering of light? On what factors does it depend ?

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49. Describe the Tyndall effect.

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50. Why is the clear sky blue ?

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51. Why are 'danger' signal lights red ?

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52. Why does the Sun appear reddish at the sunrise and the sunset ?

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Textual Exercise

1. The human eye can focus on 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 dioptres for correcting his distant vision. For correcting his near vision he needs a lens of power +1.5 dioptres. What is the focal length

of the lens required for correcting (1) distant vision and (2) 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?

Watch Video Solution

10. Why do stars twinkle ?

Watch Video Solution

11. Explain why the planets do not twinkle.

Watch Video Solution

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

Watch Video Solution

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

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Additional Questions And Answers

1. Give four points of difference between the following terms/ quantities :

Near- sightedness and Far- sightedness

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2. Give four points of difference between the following terms/ quantities :

Near point and Far point

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3. Give scientific reasons for the following statements:

To rectify the defect of near-sightedness or myopia, concave lens of suitable focal length is used as corrective lens.

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4. Give scientific reasons for the following statements:

To rectify the defect of far-sightedness or hypermetropia, convex lens of suitable focal length is used as corrective lens.

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5. Give scientific reasons for the following statements:

A rainbow is visible in the sky only after rain shower.

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6. Give scientific reasons for the following statements:

The sunrise is experienced two minutes early and the sunset is experienced two minutes delayed.

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7. Give scientific reasons for the following statements:

The clear sky appears blue in colour.

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8. Give scientific reasons for the following statements:

The danger signal lights are red in colours.

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9. Give scientific reasons for the following statements:

The sun appears reddish at sunrise and sunset.

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Objective Questions And Answers Answer The Following Questions In One Word Sentence

1. What is dispersion of white light?

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2. What happens to the image-distance in the normal eye, when we increase the distance of an object from the eye?

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3. What can be said about the focal length of the eye lens if its curvature increases ?

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4. What can be said about the curvature of the eye lens if it becomes thin?

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5. For normal eye vision what is the object distance and image-distance when the object is placed at a near point? (Take the distance between the eye lens and the retina as 2.3 cm.)

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6. For normal eye vision what is the object distance and image-distance when the object is placed at a far point? (Take the distance between the eye lens and the retina as 2.3 cm.)

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7. State the type of image of an object formed on the retina.

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8. Write the name of the most front part of human eye.

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9. State the function of the iris.

Watch Video Solution

10. State the function of light sensitive cells present in retina.

Watch Video Solution

11. Write the function of optic nerves.

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12. Write use of bifocal lens.

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13. How much duration in second increases per day due to early sunrise and delayed sunset?

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14. Due to which effect does the smoke emitted by the combustion of the engine oil in a motorcycle sometimes appears blue in colour?

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15. Which effect is developed commercially to determine the size and density of aerosol and other colloidal particles ?

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16. Wavelength of red colour is approximately how many times the wavelength of violet colour ?

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Objective Questions And Answers Fill In The Blanks

1. The type of image formed by the eye lens is ..... and .....

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2. A triangular glass prism has ..... triangular bases and ..... rectangular surfaces.

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3. Light enters our eye through the .....

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4. A person suffering from far-sightedness or hypermetropia cannot see clearly ..... objects.

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5. A ..... corrective lens is used to rectify near-sightedness.

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6. An old person suffering from near-sightedness and a far-sightedness uses ..... to rectify his vision.

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7. While passing through the prism the light ray travelling from air to glass bends towards the .....

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8. In a glass prism ..... light propagates with maximum speed.

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9. At night stars are seen slightly at a higher position than their actual position because of the .....

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10. For a light ray passing through the prism, the angle between the incident ray and the emergent ray is known as the .....

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11. At the time of sunrise the sun appears ..... in colour.

Watch Video Solution

12. The fine particles in air scatter ..... light more strongly.

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13. ..... light, while passing through a prism, does not disperse.

Watch Video Solution

14. Stars behave like ..... sources of light and planets behave like ..... sources of light.

 Watch Video Solution

15. Danger signals are red in colour because red light is .....

 Watch Video Solution

16. In the spectrum of white light, ... and ..... colours seen at the two ends.

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17. The diameter of the human eyeball is approximately ..... . cm.

Watch Video Solution

18. The distance between the eye lens and the retina is known as the .....

Watch Video Solution

19. In the normal situation in the relaxed position of the ciliary muscles, the eye lens is .....

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20. At night as we move up in the atmosphere of the earth, the refractive index ..... continuously,

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Objective Questions And Answers State Whether The Following Statements Are True Or False

1. The near point of every person is 25 cm.

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2. The splitting of white light into its constituent colours is called the scattering of light.

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3. Far-sightedness can be rectified by using a concave lens of suitable power.

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4. In the eye of myopic person, the image of a distant object is formed behind the retina.

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5. Near-sightedness arises due to more curvature of the cornea or due to the eye lens remaining thick permanently.

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6. The speed of light decreases as it passes from an optically denser medium to an optically rarer medium.

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7. A myopic person has the far point nearer than infinity

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8. A hypermetropic person has near point farther away from the normal near point (25 cm).

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9. The construction of the human eye can be compared with that of a camera.

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10. A rainbow is formed due to refraction taking place twice, one internal reflection and dispersion of sunlight by water droplets in the sky.

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11. Planets twinkle.

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12. When the sunlight passes through a canopy of dense forest, tiny water droplets in the mist, scatter the light. This effect is known as the Tyndall effect.

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Objective Questions And Answers

1. Match the following :

Column I	Column II	Column III
1. Myopia	p. The focal length of the eye lens increases	a. Bifocal lens
2. Hypermetropia	q. The focal length of the eye lens decreases	b. Concave lens
3. Presbyopia	r. The power of accommodation of the eye decreases with ageing	c. Convex lens

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2. Match the following :

Column I	Column II
1. Twinkling of stars	p. Tiny water droplets present (or suspended) in the atmosphere
2. Blue coloured sky	q. Band of colours
3. Rainbow	r. Scattering of light
4. Spectrum	s. Uneven atmosphere

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3. Match the following :

Column I	Column II
1. Human eye or eyeball	a. It controls and regulates the amount of light entering the eye.
2. Self operated accommodation power of eye	b. Delicate membrane having large number of light sensitive cells.
3. Retina	c. Works as a photographic camera.
4. Ciliary muscles	d. Not able to see the nearby objects.
5. Myopia	e. Electrical signals related to image are sent to the brain.
6. Cataract	f. A circular muscular diaphragm which can control the size of pupil.
7. Presbyopia	g. Milky and cloudy layer is formed on the eye lens.
8. Iris	h. The capacity of eye to see objects clearly between 25 cm and infinite distance.
9. Pupil	i. Increases or decreases curvature of eye lens.
10. Optic nerves	j. Image of object at infinite distance is formed in front of retina.
11. Hypermetropia	k. Accommodation power of eye decreases with ageing.

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Objective Questions And Answers Choose The Correct Option

1. Splitting of white light into its seven constituent colours is called .....

A. refraction

B. reflection

C. dispersion

D. interference

Answer: C

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2. Which colour of light deviates maximum in the dispersion of white light by a prism?

A. Violet

B. Blue

C. Green

D. Red

Answer:

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3. In the human eye, the image of an object is formed at the .....

A. iris

B. pupil

C. retina

D. cornea

Answer: C

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4. The focal length of the eye lens is changed due to the action of the.....

A. pupil

B. retina

C. ciliary muscles

D. cornea

Answer: A::C

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5. A ..... lens is used to correct presbyopia.

A. convex

B. concave

C. bi-focal

D. contact

Answer: A::B::C

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6. Out of the following, which phenomenon does not play a role in the formation of a rainbow?

A. Reflection

B. Refraction

C. Dispersion

D. Absorption

Answer: A::B

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7. Where is the image formed in the eye of a person suffering from near-sightedness?

A. On the retina

B. Behind the retina

C. In front of the retina

D. On the pupil

Answer: C

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8. Which phenomenon is responsible for the twinkling of stars ?

A. Atmospheric reflection

B. Atmospheric refraction

C. Reflection

D. Total internal reflection

Answer: A::C

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9. The phenomenon of ..... of light by the colloidal particles gives rise to the Tyndall effect.

A. reflection

B. refraction

C. scattering

D. dispersion

Answer: A::C

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10. What is the time difference between actual sunset and apparent sunset?

A. 2 seconds

B. 20 seconds

C. 2 minutes

D. 20 minutes

Answer: B

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11. Which light gets scattered maximum due to atmosphere?

A. Blue

B. Yellow

C. Green

D. Red

Answer: B

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12. Which light has minimum speed in glass (prism)?

A. Red

B. Green

C. Blue

D. Violet

Answer:

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13. When an eye is focussed on a distant object, the focal length of the eye lens is .....

A. maximum

B. minimum

C. half of its minimum

D. half of its maximum

Answer: A

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14. How many surfaces does a triangular prism have ?

A. 3

B. 4

C. 5

D. 6

Answer:

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15. The wavelengths of violet, yellow and red light are λ_v, λ_y and λ_r respectively, then .....

A. $\lambda_v > \lambda_y > \lambda_r$

B. $\lambda_v < \lambda_y < \lambda_r$

C. $\lambda_y < \lambda_v < \lambda_r$

D. $\lambda_y < \lambda_r < \lambda_v$

Answer: A::B::D

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16. For normal vision, the far point is at..... distance.

A. 25 cm

B. 1 cm

C. 1 m

D. infinite

Answer:

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17. For normal vision, the near point is .....

A. 25 cm

B. 25 m

C. zero

D. infinite

Answer: B::C

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18. Which phenomenon can explain the advance sunrise and the delayed sunset ?

A. Dispersion of light

B. Scattering of light

C. Tyndall effect

D. Atmospheric refraction

Answer: A::C

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19. Which of the following phenomena cannot be explained by scattering of light?

A. The red light used for signal lights for danger.

B. Blue colour of clear sky

C. White colour of clouds

D. Early sunrise

Answer: A

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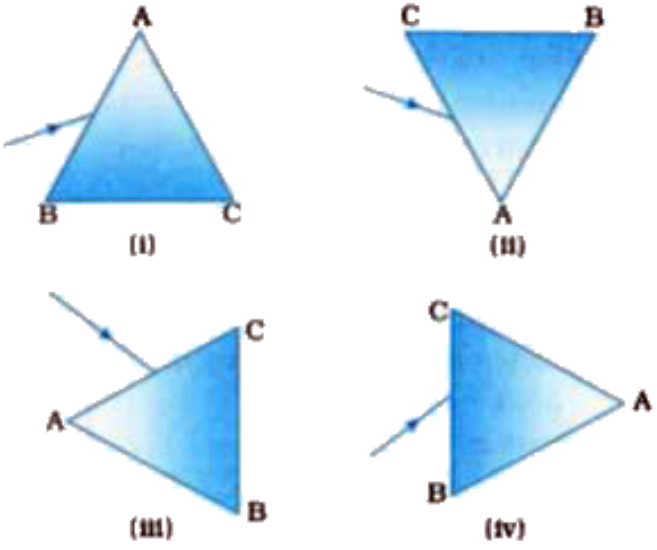
20. The base of an equilateral triangle ABC is BC. When it is arranged in four different situations and white light is incident on it, then in which of the following arrangements of the prism, the third colour from the top is the colour of clear sky in dispersion of light is produced ?



A. (I)

B. (II)

C. (III)

D. (iv)

Answer:

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21. The Sun appears white in afternoon. The reason is .....

A. less scattering of light.

B. more scattering of all the colours of white light.

C. more scattering of blue colour.

D. more scattering of red colour.

Answer: A::C

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22. Sea water at more depth appears blue. The reason is .....

A. presence of some plants in sea water.

B. the image of the sky appears in water.

C. scattering of light.

D. light is absorbed by sea water.

Answer: A::C

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23. When the ciliary muscles are relaxed, the eye lens becomes ..... and its focal length ..... This enables us to see distant objects clearly.

A. thin, increases

B. thin, decreases

C. thick, increases

D. thick, decreases

Answer: A

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24. When the ciliary muscles contract, the eye lens becomes ..... and its focal length..... This enables us to see nearby objects clearly.

A. thick, decreases

B. thick, increases

C. thin, increases

D. thin, decreases

Answer: A::C::D

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25. The rainbow on the moon ...

A. is not possible.

B. is rare.

C. is observed with the reverse order of colours.

D. is of two types.

Answer: B

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26. In dispersion of white light due to a triangular glass prism, the deviation of red colour is less compared to violet colour. The reason ...

A. is $n_v > n_r$

B. is $n_r > n_v$

C. is $n_v = n_r$

D. does not depend on n.

Answer:

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27. Which lens from the following, should a person suffering from near-sightedness use?

A. A convex lens

B. A concave lens

C. A cylindrical lens

D. A bi-focal lens

Answer: A::C

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28. Which lens is used by a person suffering from far-sightedness?

A. A convex lens

B. A concave lens

C. A cylindrical lens

D. A bi-focal lens

Answer: A::C

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29. Which of the following is true for near sightedness?

A. Nearby objects cannot be seen clearly.

B. Distant objects cannot be seen clearly.

C. The eye lens cannot become thick as required.

D. This defect can be rectified using spectacles of convex lenses.

Answer: A::B::C::D

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30. Which of the following is true for far-sightedness?

A. Nearby objects cannot be seen clearly

B. Distant objects cannot be seen clearly.

C. The eye lens cannot become thin as required.

D. This defect can be rectified using spectacles of concave lenses.

Answer: A::B::C

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31. Where is the image formed in the eye of a person suffering from far sightedness?

A. On the retina

B. Behind the retina

C. On the pupil

D. In front of the retina

Answer: A::B::D

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32. A person has a defect of eye vision. His near point is 40 cm. It means ...

A. he cannot clearly see objects at a distance more than 40 cm from the eye.

B. he can clearly see objects at a distance of 40 cm only.

C. he can clearly see objects at a distance equal to 40 cm or more from the eye.

D. he can clearly see objects at a distance less than 40 cm e.g., 25 cm from the eye.

Answer: A::B::C::D

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33. A person has a defect of vision. His far point is 1.5 m. It means...

A. he can not clearly see objects at a distance more than 1.5 m from the eye.

B. he can clearly see objects at a distance more than 1.5 m from the eye.

C. he can not clearly see objects at a distance less than 1.5 m from the eye.

D. he suffers from far-sightedness.

Answer: A

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34. Out of the following, which light is deviated minimum in the dispersion of white light through a glass prism?

A. Green

B. Violet

C. Yellow

D. Dispersion of the given three colours is the same.

Answer:

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35. Which light has maximum speed in glass?

A. Violet

B. Blue

C. Green

D. Red

Answer: D

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36. Which ray of light is present exactly at the middle of the spectrum obtained from white light?

A. Green

B. Yellow

C. Red

D. Violet

Answer:

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37. The lens in human eye is a .....

A. convex mirror

B. convex lens

C. concave mirror

D. concave lens

Answer: B

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38. For persons suffering from near-sightedness the power of the lens used in spectacles is .....

A. positive

B. zero

C. negative

D. infinite

Answer: A

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39. For a person suffering from ..... the power of the lens used in spectacles is positive.

A. far-sightedness

B. near-sightedness

C. presbyopia

D. cataract

Answer: A::D

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40. Which phenomenon/phenomena of light is / are involved in the formation of a rainbow ?

A. Refraction

B. Dispersion

C. Internal reflection

D. All of the given above

Answer: A::B::C::D

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41. ..... light from the following is least scattered by fog, dust and smoke.

A. Violet

B. Blue

C. Red

D. Yellow

Answer: D

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42. Which of the following controls the amount of light entering into the human eye?

A. Ciliary muscles

B. Pupil

C. Cornea

D. Iris

Answer:

Watch Video Solution

43. The refractive index of glass is maximum for..... light.

A. violet

B. green

C. blue

D. red

Answer:

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Objective Questions And Answers Answer The Following Questions In Very Short As Directed Miscellaneous

1. What is the power of a lens that can be used to correct the eye defect of a person who cannot see the objects distinctly kept beyond 2 m ?

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2. Why does the Sun appear white at noon ?

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3. Why is the eye lens not perfectly solid ?

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4. What is the focal length of plain goggles ?

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5. What happens when elasticity of the crystalline lens is reduced to zero ?

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6. Which defect of the eye occurs due to distortion of cornea ?

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7. How the defect of astigmatism can be corrected ?

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8. What is colour blindness? How can it be cured?

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9. In hypermetropia, how does the size of eyeball change ?

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10. What change occurs in the focal length, when our eye lens becomes thick ?

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11. What are rods and cones ?

Watch Video Solution

12. What is cataract ?

Watch Video Solution

13. What would have been the colour of the sky, had there been no atmosphere ?

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14. Due to which phenomenon is the colour of water in deep sea blue ?

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15. What is the cause for presbyopia ?

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16. Give the relationship between wavelength of light and its angle of deviation, when it is

passed through a prism.

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17. For which colour has the glass larger refractive index – violet or green ?

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18. Which part of human eye is also known as 'white of the eye' ?

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19. Why is blind spot so called ?

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20. Which liquid is filled in the space between the eye lens and the retina ?

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21. What happens to the pupil of the eye when the light is (a) very bright and (b) very dim?

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22. A man is wearing spectacles of focal length +1 m. What can be the defect in the eye ?

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23. Which portion of a bi-focal lens is

(a) a concave lens

(b)a convex lens ?

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24. When sunlight enters into a room filled with dark smoke, its path becomes visible. Name the phenomenon responsible for this.

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25. What is the function of the iris ?

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26. What are light sensitive cells ?

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27. What type of signals are generated and sent to the brain by light sensitive cells in the retina ?

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28. What holds the crystalline lens in the human eye?

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29. Which part of the human eye helps in changing the thickness of the eye lens ?

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30. What is dispersion of white light ?

Watch Video Solution

31. Give the main difference between the lens of the human eye and the lens of a camera.

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32. The image formed on the retina is inverted, but we see the object erect. Why?

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33. The absolute refractive index of a medium is 2.0. The speed of light in vacuum/air is $3 \times 10^8 ms^{-1}$. Find the speed of light in the medium.

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34. Match the column properly:

Column I (eye defect)	Column II (correcting lens)
1. Myopia	p. Bi-focal lens
2. Hypermetropia	q. Concave lens
	r. Convex lens

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35. Match the following column:

Column I (eye defect)	Column II (correcting lens)
1. Astigmatism	p. Convex lens
2. Presbyopia	q. Cylindrical lens
	r. Concave lens

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36. The far point of a myopic eye is 100 cm. What is the focal length of the lens required

to see very distant (normal far point) objects clearly?

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37. The near point of a hypermetropic eye is 75 cm. What is the focal length of the lens required to see clearly an object placed at 25 cm from the eye (normal near point)?

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38. The eye lens of human eye is a double convex lens. Agree or Disagree?

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39. Cone-shaped retinal cells respond to the brightness or intensity of light. Agree or Disagree?

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40. Which property of vision is used in cinematography ?

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41. What is aqueous humour ?

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42. What is the maximum power of accommodation of a normal eye ?

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43. What is meant by scattering of light?

Watch Video Solution

44. What is the basic cause of atmospheric refraction ?

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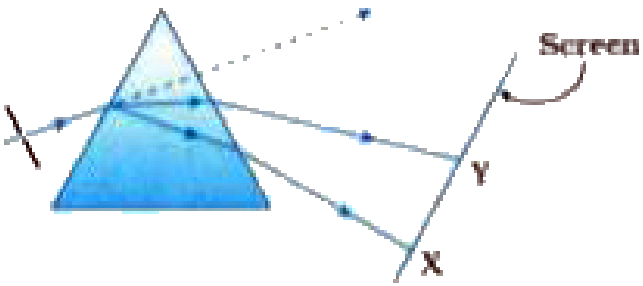
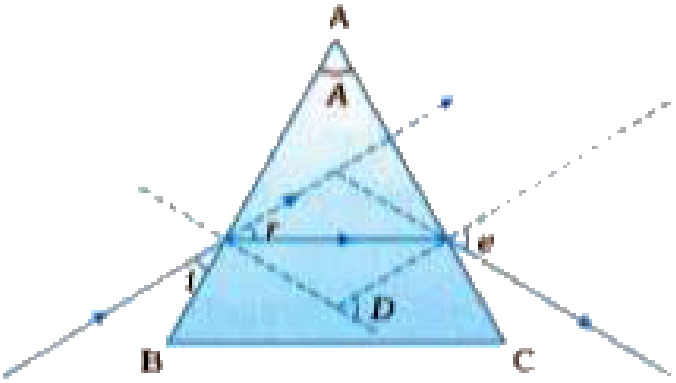


45.

In the above 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. State the colour seen at (i) X and (ii) Y.

Watch Video Solution

46. 

In the above figure, which angles are correctly marked ?

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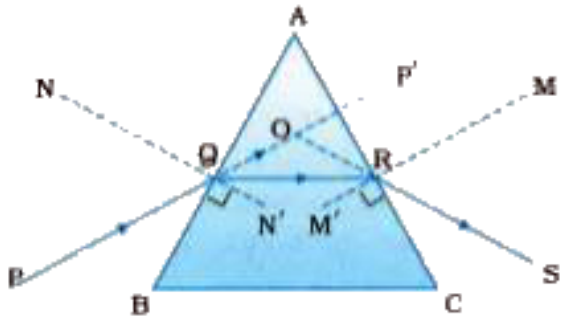
47.



In the above figure (ray diagram), state the angle of incidence and the angle of deviation.

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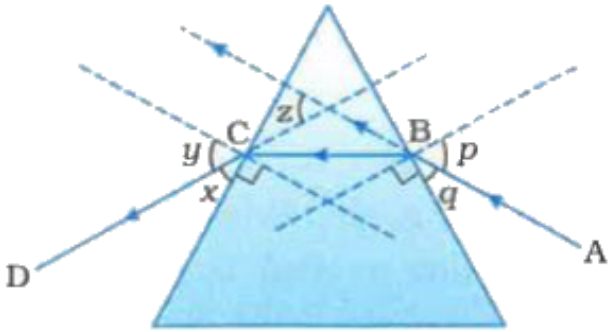

48.

In the above figure (ray diagram), state angle of incidence, angle of emergence and angle of deviation.

Watch Video Solution

49. What is the principle of the working of the human eye?

Watch Video Solution

50. On which factor does the colour of the scattered white light depend ?

Watch Video Solution

51. Give the scientific names of the following parts of the eye :

(a) Carrying signals from an eye to the brain.

(b) A small opening (hole) in the middle of the iris.

Watch Video Solution

52. A near-sighted person has a near point 25 cm and a far point 50 cm. Can he see clearly an object at a distance of: (i) 5 cm, (ii) 25 cm, (iii) 60 cm. Write 'Yes' or 'No' only.

Watch Video Solution

53. The near point of a far-sighted person is 50 cm.

Can the person see clearly an object at a distance of: (i) 20 cm (ii) ∞ (infinity)

Watch Video Solution

54. How much is our horizontal field of view

(a) with one eye open

(b) with both eyes open ?

Watch Video Solution

55. Which of the following have a wider field of view ?

(a) Animals having two eyes on the opposite sides of their head or (b) Animals having two eyes at the front of their head.

Watch Video Solution

Value Based Questions With Answers

1. Mauli and Vishva are best friends and they study in 4th grade. Recently, Mauli has been facing difficulty in reading the blackboard text from the last desk / bench. Vishva wonders why Mauli avoids sitting on the last desk / bench. On observation, Vishva found that Mauli often carries junk food in her lunch. Vishva has started sharing her lunch full of green vegetables and fruits with her. Mauli is now better and has also started taking a "balanced diet".

Name the eye defect Mauli is suffering from.

Watch Video Solution

2. Mauli and Vishva are best friends and they study in 4th grade. Recently, Mauli has been facing difficulty in reading the blackboard text from the last desk / bench. Vishva wonders why Mauli avoids sitting on the last desk / bench. On observation, Vishva found that Mauli often carries junk food in her lunch. Vishva has started sharing her lunch full of green vegetables and fruits with her. Mauli is now better and has also started taking a

"balanced diet".

What are two possible deformities related to her eye defect?

Watch Video Solution

3. Mauli and Vishva are best friends and they study in 4th grade. Recently, Mauli has been facing difficulty in reading the blackboard text from the last desk / bench. Vishva wonders why Mauli avoids sitting on the last desk / bench. On observation, Vishva found that

Mauli often carries junk food in her lunch. Vishva has started sharing her lunch full of green vegetables and fruits with her. Mauli is now better and has also started taking a "balanced diet".

What values do you learn from Vishva and Mauli?

Watch Video Solution

4. An eye camp was organised by the doctors in a village. They found that the eyes of aged

people in the village have the near point receded and the far point also gets reduced. Often aged people suffer from both myopia and hypermetropia. Doctors (opthalmologists) provide these people spectacles of bi-focal lenses to correct the defects. The people were happy and grateful to the doctors.

Name the eye defect from which the people were suffering

Watch Video Solution

5. An eye camp was organised by the doctors in a village. They found that the eyes of aged people in the village have the near point receded and the far point also gets reduced. Often aged people suffer from both myopia and hypermetropia. Doctors (opthalmologists) provide these people spectacles of bi-focal lenses to correct the defects. The people were happy and grateful to the doctors.

Give any two causes of this defect.

 Watch Video Solution

6. An eye camp was organised by the doctors in a village. They found that the eyes of aged people in the village have the near point receded and the far point also gets reduced. Often aged people suffer from both myopia and hypermetropia. Doctors (opthalmologists) provide these people spectacles of bi-focal lenses to correct the defects. The people were happy and grateful to the doctors.

What were benefits to organise such camps in rural areas ? Give two suggestions.

Watch Video Solution

7. Four friends went to a picnic. The weather was pleasant. They played various games and then had snacks. Suddenly, Raju, one of them, observed seven colours in the sky. He said to others, "wow what a rainbow"!

Ram, one of them, asked him "What is a rainbow?" Raju then explained to all about its formation.

After that everyone in the group thanked Raju for the knowledge, he had given to them.

When Raju was facing the rainbow, where was the Sun ?

Watch Video Solution

8. Four friends went to a picnic. The weather was pleasant. They played various games and then had snacks. Suddenly, Raju, one of them, observed seven colours in the sky. He said to others, "wow what a rainbow"!

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formation.

After that everyone in the group thanked Raju for the knowledge, he had given to them.

Which device can be used to obtain such a phenomenon ?

Watch Video Solution

9. Four friends went to a picnic. The weather was pleasant. They played various games and then had snacks. Suddenly, Raju, one of them, observed seven colours in the sky. He said to

others, "wow what a rainbow"!

Ram, one of them, asked him "What is a rainbow?" Raju then explained to all about its formation.

After that everyone in the group thanked Raju for the knowledge, he had given to them.

What moral value do you learn from Raju ?

Watch Video Solution

10. In a beautiful valley, there was a village. When trains passed from the village, the

whistle and the sound of train, mixed with the sound of waterfall, seemed to be very pleasant to everyone. Hence, children of that village used to play near the railway track. Once on a very light foggy day, a group of children found that a fish plate was missing from the track. As such, all the villagers were worried.

Prashant, one of the children, suddenly put his ear to the line and tried to know whether a train is coming or not. He knew a train is coming. He asked his friends to inform the railway cabin crew and he himself put off his red shirt and started running towards the

train, waving his red shirt. The driver and cabin man got the alert signal in time and thus a major accident was averted.

Name the two physical phenomena of science used by Prashant.

Watch Video Solution

11. In a beautiful valley, there was a village. When trains passed from the village, the whistle and the sound of train, mixed with the sound of waterfall, seemed to be very pleasant

to everyone. Hence, children of that village used to play near the railway track. Once on a very light foggy day, a group of children found that a fish plate was missing from the track. As such, all the villagers were worried.

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major accident was averted.

Why did Prashant use his red shirt instead of any other coloured shirts ?

Watch Video Solution

12. In a beautiful valley, there was a village. When trains passed from the village, the whistle and the sound of train, mixed with the sound of waterfall, seemed to be very pleasant to everyone. Hence, children of that village used to play near the railway track. Once on a

very light foggy day, a group of children found that a fish plate was missing from the track. As such, all the villagers were worried.

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What moral values do you learn from Prashant ?

Watch Video Solution

13. Millions of people of the developing countries of the world are suffering from corneal blindness. They can be cured by replacing the defective cornea with the cornea of a donated eye.

A charitable society of your city has organised a campaign in your neighbourhood in order to

create awareness about this fact.

State the objective of organising such campaigns.

Watch Video Solution

14. Millions of people of the developing countries of the world are suffering from corneal blindness. They can be cured by replacing the defective cornea with the cornea of a donated eye.

A charitable society of your city has organised

a campaign in your neighbourhood in order to create awareness about this fact.

Write one argument which you would give to motivate the people to donate their eyes after death.

Watch Video Solution

15. Millions of people of the developing countries of the world are suffering from corneal blindness. They can be cured by replacing the defective cornea with the cornea

of a donated eye.

A charitable society of your city has organised a campaign in your neighbourhood in order to create awareness about this fact.

List two values which could be developed in the persons who actively participate and contribute in such programme.

Watch Video Solution

16. Mr Bharat's 65 year old mother was complaining about blurred vision in both the

eyes due to which she could not see things clearly, Mr Bharat took his mother to an eye hospital. The doctor examined her eyes carefully and concluded that she has a medical condition which could not be corrected by using any type of spectacle lenses and it required surgery. Her eyes were operated upon and she could then see once again properly.

What could be the defect in the eyes of Mr Bharat's mother?

Watch Video Solution

17. Mr Bharat's 65 year old mother was complaining about blurred vision in both the eyes due to which she could not see things clearly, Mr Bharat took his mother to an eye hospital. The doctor examined her eyes carefully and concluded that she has a medical condition which could not be corrected by using any type of spectacle lenses and it required surgery. Her eyes were operated upon and she could then see once again properly.

What happens to the eye lens during this

defect? What is done during surgical operation of the eyes to restore the correct vision ?

Watch Video Solution

18. Mr Bharat's 65 year old mother was complaining about blurred vision in both the eyes due to which she could not see things clearly, Mr Bharat took his mother to an eye hospital. The doctor examined her eyes carefully and concluded that she has a medical

condition which could not be corrected by using any type of spectacle lenses and it required surgery. Her eyes were operated upon and she could then see once again properly.

What values do you learn from Mr Bharat in this episode?

Watch Video Solution

19. Amit is a domestic help (or maid) working at Mr Dave's house. One day Amit complained

to Mr Dave that he had difficulty in reading the letter which he had received from his parents. Mr Dave, realising that Amit had an eye defect, took him to an eye specialist doctor. The doctor tested his eyes carefully and told Amit to wear spectacles containing certain type of lenses having specified power. Mr Dave bought the required spectacles for Amit. By wearing this spectacle, Amit could read and write easily. He was very happy and thanked Mr Dave.

What could be the eye defect Amit was suffering from?

Watch Video Solution

20. Amit is a domestic help (or maid) working at Mr Dave's house. One day Amit complained to Mr Dave that he had difficulty in reading the letter which he had received from his parents. Mr Dave, realising that Amit had an eye defect, took him to an eye specialist doctor. The doctor tested his eyes carefully and told Amit to wear spectacles containing certain type of lenses having specified power. Mr Dave bought the required spectacles for

Amit. By wearing this spectacle, Amit could read and write easily. He was very happy and thanked Mr Dave.

What could be the two possible reasons responsible for his eye defect? What type of lenses do you think the doctor recommended for Amit's spectacles ?

Watch Video Solution

21. Amit is a domestic help (or maid) working at Mr Dave's house. One day Amit complained

to Mr Dave that he had difficulty in reading the letter which he had received from his parents. Mr Dave, realising that Amit had an eye defect, took him to an eye specialist doctor. The doctor tested his eyes carefully and told Amit to wear spectacles containing certain type of lenses having specified power. Mr Dave bought the required spectacles for Amit. By wearing this spectacle, Amit could read and write easily. He was very happy and thanked Mr Dave.

What values are displayed by Mr Dave in this episode?

Watch Video Solution

22. Rohit is a car driver working for Mr Joshi. One day Rohit complained that he had difficulty in driving the car because he could not see the distant traffic clearly though he could see the nearby objects clearly. Mr Joshi took Rohit to an eye hospital. The eye specialist doctor checked and tested his eyes with various machines and gave him the name and power of the lenses to be worn as spectacles.

Mr Joshi paid for the required spectacles for the driver. By wearing these spectacles, the driver could now see even the distant vehicles and people on the road clearly. He thanked Mr Joshi for this.

Name the eye defect Rohit is suffering from.

Watch Video Solution

23. Rohit is a car driver working for Mr Joshi. One day Rohit complained that he had difficulty in driving the car because he could

not see the distant traffic clearly though he could see the nearby objects clearly. Mr Joshi took Rohit to an eye hospital. The eye specialist doctor checked and tested his eyes with various machines and gave him the name and power of the lenses to be worn as spectacles.

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What could be the two possible reasons for

his eye defect? What type of lenses do you think the doctor recommended for Rohit's spectacles ?

Watch Video Solution

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Mr Joshi paid for the required spectacles for the driver. By wearing these spectacles, the driver could now see even the distant vehicles and people on the road clearly. He thanked Mr Joshi for this.

What values (or qualities) do you learn from Mr Joshi in this episode ?

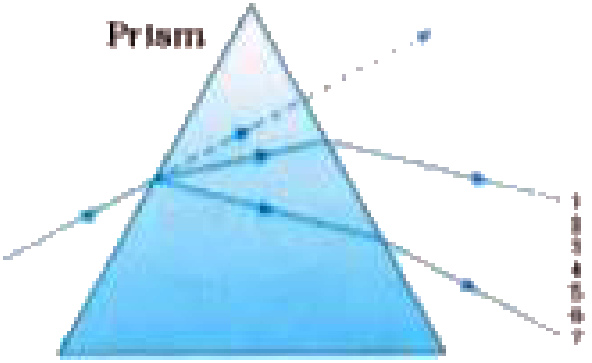
Watch Video Solution

Practical Skill Based Questions With Answers

1. Dispersion is caused by refraction and not by reflection. Why?

Watch Video Solution

2. 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.

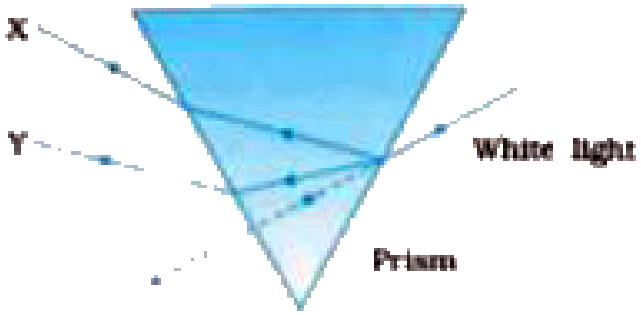


(1) The colours at positions marked 3 and 5 are similar to the colour of the sky and the colour of gold (metal), respectively. Is the above statement made by a student correct or incorrect. Justify.

(2) Which of the positions shown above correspond approximately to the colour of (a) a brinjal, (b) danger signal, (c) neel (Lll) (applied to clothes), (d) orange.

Watch Video Solution

3. When a beam of white light is passed through a triangular glass prism, it gets dispersed into its component colours. Why do we get these colours ? In the given figure, the colours X and Y represent the extreme components of the spectrum. Identify X and Y.



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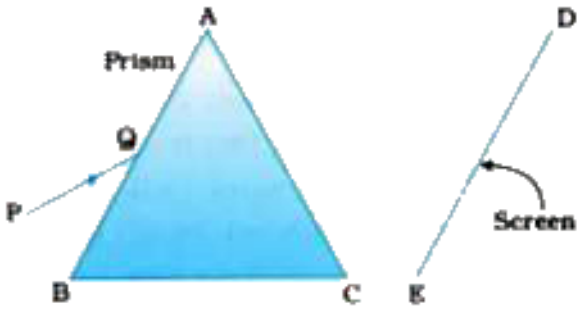
4. A narrow beam PQ of white light passes through a glass prism ABC as shown in the diagram.



Trace it on your answer sheet and show the path of the emergent beam as observed on the screen DE.

(1) Write the name and cause of the

phenomenon observed.

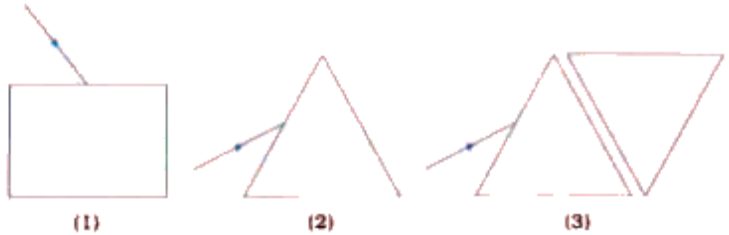
(2) Where else in nature is this phenomenon observed ?

(3) Based on this observation, state the conclusion which can be drawn about the constituents of white light.

Watch Video Solution

5. (a) A narrow beam of white light is incident on three glass objects as shown below. Comment on the nature of the behaviour of

the emergent beam in all three cases.



(b) There is a similarity between two of the emergent beams. Identify the two.

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