PHYSICS

BOOKS - RAO'S ACADEMY

THE HUMAN EYE AND THE COLOURFUL WORLD

Text Book 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 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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Text Book Exercise Questions

1. The human eye can focus objects at different distance 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 this

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 about

A. 25m

B. 2.5cm

C. 25cm

D. 2.5m

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 dioptre. What is the focal length of the lens required for correcting

near vision?

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6. 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

dioptre. What is the focal length of the lens required for correcting

near vision?

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7. The far point of a myopic person is 80cm in front of the eye. What is the nature and power of the lens required to correct the problem?

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

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

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

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11. Why do stars twinkle?

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12. Explain why the planets do not twinkle?

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

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

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Additional Questions

1. Which type of image is formed on the retina?

A. Virtual and erect

B. Real and inverted

C. Real and erect

D. Virtual and inverted

Answer: B

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2. What is the name of the outer thin membrane over the eyeball?

A. Retina

B. Irish

C. Vitreous humour

D. Cornea

Answer: A

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3. The size of the pupil is controlled by which of these?

A. Retina

B. Ciliary muscles

C. Iris

D. Cornea

Answer: C

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4. What is the minimum distance for clear visibility in human eyes?

A. 25 cm

B. 5cm

C. 10cm

D. 20cm

Answer: A

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5. Which of the following is true about a person suffering from myopia ?

A. Cannot see nearby objects

B. Cannot see objects at middle distance

C. Can see only far off objects

D. Can see nearby objects

Answer: D

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6. Name the type of lens used to correct

(i) Myopia

(ii) Hypermietropia

A. Biconvex lens

B. Biconcave lens

C. Concave lens

D. Plano-convex lens

Answer: C

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7. Bi-focal lens is advised to a patient suffering from which of these conditions?

A. Hypermetropia

B. Cataract

C. Presbiopia

D. Myopia

Answer: C

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8. Which colour from the visible spectrum can travel the farthest?

A. Red

B. Blue

C. Green

D. Violet

Answer: A

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9. Which of these is responsible for the formation of rainbow?

A. All of these

B. Refraction

C. Dispersion

D. Total internal reflection

Answer: C

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10. Twinkling of stars happens because of which of these?

A. Refraction

B. Dispersion

C. Total internal reflection

D. none of these

Answer: A

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11. Tyndall effect happens due to which of these?

A. Scattering

B. Refraction

C. Dispersion

D. Total internal reflection

Answer: A

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Short Questions

1. Why is eye lens of telescope smaller than objective lens?

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2. What is short sight? How can it be corrected?

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3. State the condition to get a larger magnification of a small object by a compound microscope

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4. Which part of the human eye helps in the perception of colours?

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5. Differentiate between a microscope and telescope on its use.

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6. Why does the objective lens of an astronomical telescope have a large light gathering power?

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7. Where should an object be placed in front of a convex lens so as to use it as a simple microscope?

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8. Which of the two, objective or eye piece has a large aperture? Give reason for your answer.

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9. What property of the eye of the principle of motion pictures ?

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10. What is a spectrum?

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11. What is dispersion of light?

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12. What is Asti gmatism?

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Long Questions

1. Which phenomenon of vision is made use of in cinematography? Explain briefly how it is used?

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2. How does an eye focus the object lying at various distances?

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3. What are coaxial lenses and where are they used?

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4. A person uses convex lens spectacles. What vision defect does he have? Draw a diagram

(1) To show the defective eye

(2) To show the correction with the lens

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5. A boy uses concave spectacles. What defect does the have ? Draw a diagram

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6. Draw a ray diagram of a simple microscope and its working principle

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7. Describe the refraction of light through prism. Draw the diagram and explain

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8. What is tyndall effect?

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Higher Order Thinking Skills

1. Different colours deviate through different angles on passing through a prism?

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2. Can visible light be scattered by atoms/molecules in earth's atmosphere?

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Value Based Questions

1. Sananth was standing outside in the evening, enjoying the light drizzle after the rain. Suddenly he observed a rainbow in the sky. He called his father and asked him, what it is and how is it formed? His father explained him about its formation and also told him that similar phenomena can be observed with prism also.

What is the name of the phenomena ? Which colour deviates more and why ?

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2. Sananth was standing outside in the evening, enjoying the light drizzle after the rain. Suddenly tie observed a rainbow in the sky. He called his father and asked him, what it is and how is it formed? His father explained him about its formation and also told him that similar phenomena can be observed with prism also.

What value did Sanath's father exhibit ?

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3. The doctor prescribed her reading glasses, which can only worn for close-up work such as reading what value did Mr. Ramji exhibit?

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Numerical Problems

1. For an eye, the defective near point is 150 cm. Calculate power of correcting convex lens to correct this vision defect.

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2. 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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3. The near point of eye suffering from hypermetropia is 1 m. Calculate the Power that is needed to correct this eye defect. In this case we are assuming the near point as 25 cm.

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4. If a person can't see the object that is placed at a distance less than 50 cm, then what type of defect he is suffering from? Also tell the nature of lens and calculate the power of the lens so that he can clearly see the object that is placed at 25 cm from the eye.

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