

**Chapter – (Human Eye and Colourful World)****Topic - 1 (Structure of Eye and Eye Defects)****Very Short Answer Type Questions**

Q.1. Define power of accommodation.

OR

What is meant by power of accommodation of the eye?

Q.2. What is the purpose of human eye?

Q.3. State one function of iris in human eye.

Q.4. Name the part of the human eye that helps in changing the focal length of the eye lens.

Q.5. What is the range of vision of a normal human eye?

Q.6. What is the function of pupil in human eye?

Q.7. Name the part of the eye?

(i) that controls the amount of light entering into the eye.

(ii) that had real, inverted image of the object formed on it.

Q.8. what is the nature of the image formed on the retina?

Q.9. What is the principal of the working of the human eye?

Q.10. A person is advised to wear spectacles with convex lenses. State the defect of vision he is suffering from.

**Short Answer Type Questions – I**

Q.1. What are Rods and Cones?

Q.2. State the structure of iris and its function in human eye.

Q.3. (i) Define distance of distinct vision and give its range.

(ii) What is the role of iris in a human eye?

Q.4. How is a normal eye able to see distinctly distant as well as nearer objects? What is the distance of distinct vision?

Q.5. What is meant by near point and far point of an eye? State their values for the normal human eye.

OR

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

Q.6. Why does it take some time to see the objects in a dim room when we enter the room from bright sunlight outside?

Q.7. Why does it takes some time to see objects in a cinema hall when we just enter the hall from bright sunlight? Explain in brief.

Q.8. (i) What is meant by least distance of distinct vision?

(ii) How does the thickness of the eye lens change when we shift looking from a distant tree to reading a book?

(iii) Eye lens is comparatively thicker, while reading a book.

Q.9. When a person is said to have developed cataract? How is the vision of such a person restored?

Q.10. An old person is unable to see clearly nearby object as well as distant objects:

(i) What defect of vision is he suffering from?

(ii) What kind of lens will be required to see clearly the nearby as well as distant objects? Give reason.

### **Short Answer Type Questions – II**

Q.1. State one main function each of iris, pupil and cornea.

Q.2. What is meant by the term 'Power of accommodation' of human eye? How does it help a person to see nearby as well as distant objects clearly?

Q.3. (i) What is meant by 'least distance of distinct vision'?

(ii) How does iris controls the size of the pupil in bright light and dim light?

Q.4. What are the values of (a) near point and (b) far point of vision of a normal adult person?

(ii) A person with a myopic eye cannot see objects beyond 1.2 m directly. What would be its power?

Q.5. (i) Make a ray diagram to show how the eye defect-myopia is corrected by using a suitable lens.

(ii) State two reasons due to which this eye defect may be caused.

(iii) A person with myopia eye cannot see objects beyond a distance of 1.5 m. What is the power of the lens required to correct the problem?

Q.6. (i) Draw a diagram to show the formation of image of a distant object by a myopic eye. How can such an eye-defect be rectified?

(ii) State two reasons due to which this eye defect may be caused.

Q.7. Discuss how the brain perceives the image formed on the retina.

Q.8. The near point of a person suffering from hypermetropia is 75 cm. Calculate the focal length and power of the lens required to enable him to read the newspaper which is kept at 25 cm from the eye.

Q.9. (i) Ravi kept a book at a distance of 10 cm from the eyes of his friend Hari. Hari is not able to read anything written on the book. Explain why?

(ii) A lens of focal length 5.0 cm is being used by a student in the laboratory as a magnifying glass. His least distance of distinct vision is 25 cm. What magnification is the student getting?

### Long Answer Type Questions

Q.1. (a) Write the function of each of the following parts of human eye : Cornea; iris; crystalline lens; ciliary muscles.

(b) Millions of people of the developing countries of world are suffering from corneal blindness. These persons 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. If you are asked to participate in this mission how would you contribute in this noble cause?

(i) State the objective of organising such campaigns.

(ii) List two arguments which you would give to motivate the people to donate their eyes after death.

(iii) List two values which are developed in the persons who actively participate and contribute in such programmes.

Q.2. 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.

Q.3. Name the eye defect in which eye lens becomes cloudy or milky. Mention the method for its correction. A person uses a lens of power  $-1.0\text{ D}$  for correcting his distant vision and for correcting his near vision he uses a lens of power  $+2.0\text{ D}$ . Calculate the focal length of the lenses required to correct these defects. Explain why a normal eye is not able to see clearly the objects placed closer than the near points.

Q.4. A student is unable to see clearly the words written on the blackboard placed at a distance of approximately 4 m from him. Name the defect of vision the boy is suffering from. Explain the method of correcting this defect. Draw ray diagram for the :

(i) defect of vision and also

(ii) For its correction.

OR

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

Q.5. (i) List the parts of the human eye that control the amount of light entering into it. Explain how they perform this function.

(ii) Write the function of retina in human eye.

(iii) Do you know that the corneal – impairment can be cured by replacing the defective cornea with the cornea of the donated eye? How and why should we organise groups to motivate the community members to donate their eyes after death ?

Q.6. (i) List three common refractive defects of vision. Suggest the way of correcting these defects.

(ii) About 45 lac people in the developing countries are suffering from corneal blindness. About 30 lac children below the age of 12 years suffering from this defect can be cured by replacing the defective cornea with the cornea of a donated eye. How and why can students of your age involve themselves to create awareness about this fact among people?

Q.7. (a) State the reasons which lead to hypermetropia. With the help of suitable diagram explain this defect of vision and its correction.

(b) Draw diagram of an experimental arrangement for observing scattering of light in colloidal solution. Name the two chemicals used in this activity.

Q.8. (a) A person cannot read newspaper placed nearer than 50 cm from his eyes. Name the defect of vision he is suffering from. Draw a ray diagram to illustrate this defect. List its two possible causes. Draw a ray diagram to show how this defect may be corrected using a lens of appropriate focal length.

(b) We see advertisements for eye donation on television or in newspaper. Write the importance of such advertisements.

Q.9. (i) Name the defect of vision in which the eye loses its power of accommodation due to old age.

(ii) The near point of a person suffering from hypermetropia is at 50 cm from his eye. What is the power of the lens needed to correct this effect / (near point of normal eye is 25 cm).

(iii) With the help of ray diagrams, show the formation of image by

(a) a hypermetropic eye.

(b) correction of hypermetropia by using an appropriate lens.

Q.10. (i) What type of spectacles should be worn by a person having the defect of myopia as well as hypermetropia?

(ii) The far point of a myopic person is 150 cm. What is the nature and the power of lens required to correct the defect?

(iii) With the help of ray diagrams, show the formation of image by (i) a myopic eye (ii) correction of myopic eye by using an appropriate lens.

**Topic - 2 (Refraction of Light And Dispersion)****Very Short Answer Type Questions**

- Q.1. What is meant by dispersion of light?
- Q.2. What is Tyndall effect?
- Q.3. Name the type of particles which acts as a prism in the formation of rainbow in the sky.
- Q.4. Which coloured component bends the least during the dispersion of white light through prism?
- Q.5. Which colour of white light suffers (i) least deviation and (ii) maximum deviation when a beam of white light passes through a glass prism?

OR

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

- Q.6. On which factor does the colour of the scattered white light depend?
- Q.7. The sky appears dark to passengers flying at a very high altitude. Why?
- Q.8. The sky appears dark instead of blue to an astronaut. State its reason.
- Q.9. What is the cause of dispersion of light on passing through a prism?

**Short Answer Type Questions-I**

- Q.1. (i) Define dispersion of light
- (ii) Name the colour that deviates least and the one which deviates most while passing through a glass prism.
- Q.2. What is dispersion? What happens when light is passed through a glass prism.
- Q.3. (i) A beam of white light splits when it passes through a prism. Name this phenomenon and give its reason.
- (ii) List the colours into which it splits in the decreasing order of their bending on emergence from prism.
- Q.4. Define angle of deviation. Why do different components of white light split up into spectrum when it passes through a triangular glass prism?
- Q.5. What is scattering of light? Explain with the help of an example.
- Q.6. Why do stars appear to twinkle? Explain.
- Q.7. Explain why the planets do not twinkle.
- Q.8. Why do different colours get separated when white light passes through a prism? How can we recombine the components of white light after a prism has separated them. Explain.
- Q.9. (i) Why do parallel rays of different colours deviate differently while passing through a glass prism?

(ii) Name any two phenomenon associated with the formation of a rainbow.

Q.10. During sunrise and sunset sky appears red while during the day it appears blue. Explain these natural phenomenon.

Q.11. Why did the clear sky appear blue? OR Why is the colour of the clear sky blue?

Q.12. Stars twinkle while the planets do not. Why?

Q.13. Why does the sun look reddish at the time of sunrise and sunset? Explain.

Q.14. Draw a labelled diagram to explain the formation of a rainbow in the sky.

### **Short Answer Type Questions-II**

Q.1. What is meant by scattering of light? The sky appears blue and the sun appears reddish at sunrise and sunset. Explain these phenomena with reason.

OR

What is the difference of colors of the sun observed during sunrise / sunset and noon? Give explanation of each?

Q.2. State the cause of dispersion of white light passing through a glass prism. How did Newton show that white light of sun contains seven colours using two identical glass prisms. Draw a ray diagram to show the path of light when two identical glass prisms are arranged together in inverted position with respect to each other and a narrow beam of white light is allowed to fall obliquely on one of the focus of the first prism.

Q.3. Define angle of deviation. Why do different components of white light split up into spectrum when it passes through a triangular glass prism? Show the angle of deviation for red colour when white light passes through a prism.

Q.4. Name the phenomenon associated with the following:

(i) The sky appear blue.

(ii) Formation of a rainbow in the sky.

(iii) Twinkling of stars.

Q.5. (i) Define power of a lens and write its SI unit.

(ii) A convex lens of power 4D is placed at a distance of 40 cm from a wall. At what distance from the lens should a candle be placed so that its image is formed on the wall?

Q.6. Enlist atleast six phenomena observed in nature subsequent to the scattering of light.

Q.7. State the difference in colours of the sun observed during sunrise /sunset and noon. Give explanation for each?

Q.8. Why does the sun appear reddish early in the morning? Will this phenomenon be observed by an observer on the moon? Justify your answer with a reason.

OR

Why does the sun appear reddish early in the morning?

Q.9. Explain in brief the reason for each of the following :

- (i) The sun appears reddish during sun-rise.
- (ii) At noon the sun appears white.
- (iii) To an astronaut the sky appears dark instead of blue.

Q.10. What is meant by advance sunrise and delayed sunset? Draw a labeled diagram to explain these phenomena.

Q.11. (i) “Stars seem higher than they actually are”

(ii) “The sky appears dark to passengers flying at very high altitudes”

Justify these statements with reason.

Q.12. Describe an 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.

Q.13. Explain in brief the reason for each of the following:

- (i) Advanced sun – rise
- (ii) Delayed sun – set
- (iii) Twinkling of stars

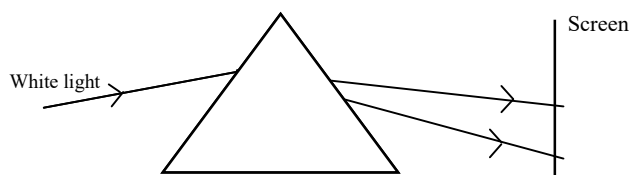
Q.14. Explain giving reason why the sky appears blue to an observer from the surface of the earth? What will the colour of the sky be for an astronaut staying in the international space station orbiting the earth? Justify your answer giving reason.

Q.15. Why does the sun seem to rise two minutes before the actual sunrise and set two minutes after the actual sunset? Explain with the help of labeled diagram.

Q.16. Explain with the help of labeled diagram, the cause of twinkling of stars.

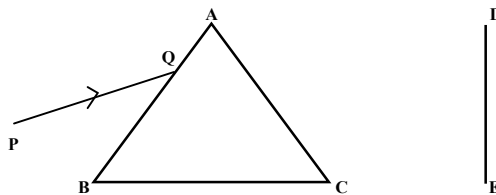
Q.17. A beam of white light falling on a glass prism gets split up into seven colours. A student makes the statement:

- (i) The colour at positions marked 1 and 3 are similar to the colour of ‘turmeric’ and the colour of ‘Chilly Powder’, respectively. Is the above statement correct or incorrect? Justify.
- (ii) Which two positions correspond to the colour of solution of copper sulphate and signal used to move the vehicles?
- (iii) Light of colour of chilly powder bends the most while the light of colour of brinjal bends the least is the statement correct? Justify.



Q.18. What is Tyndall effect? Give at least two examples illustrating Tyndall effect.

Q.19. A narrow beam PQ of white light is passing 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.

- Write the name and cause of the phenomenon observed.
- Where else in nature is this phenomenon observed?
- Based on this observation, state the conclusion which can be drawn about the constituents of white light.

Q.20. A person is unable to see objects nearer than 50 cm. He wants to read a book placed at a distance of 25 cm. Find the nature, focal length and power of the lens he requires for his spectacles.

### Long Answer Type Questions

Q.1. (i) What is dispersion of white light? State its cause.

(ii) "Rainbow is an example of dispersion of sunlight". Justify this statement by explaining, with the help of a labelled diagram, the formation of a rainbow in the sky. List two essential conditions for observing a rainbow.

Q.2. (i) Define dispersion of light. How is scattering of light different from dispersion? Give one example of natural phenomenon based on each of these.

(ii) A beam of light consisting of red, blue and yellow is incident on the prism as shown below. Complete the diagram to show refracted and emergent ray.

Q.3. What is atmospheric refraction? Use this phenomenon to explain the following natural events.

Q.4. (a) Write an activity for observing scattering of light in colloidal solution.

(b) On the basis of this activity explain why sky appears red at sunrise or sunset.

Q.5. (a) Describe an activity along with a labeled diagram the phenomenon of dispersion through a prism.

(b) Explain in brief the formation of rainbow with the help of figure.

Q.6. (i) A person's image when seen through a stream of hot air arising above a fire disperses to waver. Explain.

(ii) Define dispersion. How does a prism disperse white light?

(iii) Which colour of light bends the most and the least?