HUMAN EYE AND THE COLOURFUL WORLD

Question 1. State one function of iris in human eye. (AI 2012)

Question 2. State one function of the crystalline lens in the human eye. (Foreign 2012)

Question 3. Define the term power of accommodation. Write the modification in the curvature of the eye lens which enables us to see the nearby objects clearly? (Delhi 2019)

Question 4. Trace the sequence of events which occur when a bright light is focused on your eyes. (Delhi 2019)

Question 5.
Write about power of accommodation of human eye. Explain why the image distance in the eye does not change when we change the distance of an object from the eye? (Delhi 2017)

Question 6.
State the function of each of the following parts of human eye:
(i) Cornea
(ii) Iris
(iii) Pupil (1.5/3, Delhi 2013 C)

Question 7. Write the function of each of the following parts of human eye:
(i) Cornea (ii) Iris (iii) Crystalline lens (iv) Ciliary muscles (2/5, 2018, Delhi 2016)

Question 8. State the function of each of the following parts of the human eye :
(i) Cornea (ii) Iris (iii) Pupil (iv) Retina (2/5, Foreign 2015)

Question 9. (a) List the parts of the human eye that control the amount of light entering into it. Explain how they perform this function?
(b) Write the function of retina in human eye. (3/5, AI2014)

Question 10. Person suffering from cataract has
(a) elongated eyeball
(b) excessive curvature of eye lens
(c) weakened ciliary muscles
(d) opaque eye lens

Question 11. (a) List two causes of hypermetropia.
(b) Draw ray diagrams showing (i) a hypermetropic eye and (ii) its correction using suitable optical device. (2020)

Question 12. (a) A person is suffering from both myopia and hypermetropia.
(i) What kind of lenses can correct this defect?
(ii) How are these lenses prepared?
(b) A person needs a lens of power +3 D for correcting his near vision and -3 D for correcting his distant vision. Calculate the focal lengths of the lenses required to correct these defects. (2020)

Question 13. A person may suffer from both myopia and hypermetropia defects.
(a) What is this condition called?
(b) When does it happen?
(c) Name the type of lens often required by the persons suffering from this defect. Draw labelled diagram of such lenses. (2020)

Question 14. What eye defect is myopia? Describe with a neat diagram how this defect of vision can be corrected by using a suitable lens. (AI 2011)

Question 15. Name the three common defects of vision. What are their causes? Name the type of lens used to correct each of them. (Foreign 2011)

Question 16. A student is unable to see clearly the words written on the black board placed at a distance of approximately 3 m from him. Name the defect of vision the boy is suffering from. State the possible causes of this defect and explain the method of correcting it. (3/5, 2018)

Question 17. A student suffering from myopia is not able to see distinctly the objects placed beyond 5 m.
(a) List two possible reasons due to which this defect of vision may have arisen. With the help of ray diagrams, explain
(i) Why the student is unable to see distinctly the objects placed beyond 5 m from his eyes?
(ii) The type of the corrective lens used to restore proper vision and how this defect is corrected by the use of this lens.
(b) If, in this case, the numerical value of the focal length of the corrective lens is 5 m, find the power of the lens as per the new Cartesian sign convention. (AI 2017)

Question 18. 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?
(a) State the objective of organising such campaigns.
(b) List two arguments which you would give to motivate the people to donate their eyes after death.
(c) List two values which are developed in the persons who actively participate and contribute in such programmes. (VBQ, 3/5, Delhi 2016)

Question 19. 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 (Delhi 2015)

Question 20. Write the importance of ciliary muscles in the human eye. Name the defect of vision that arises due do gradual weakening of the ciliary muscles in old age. What type of lenses are required by the persons suffering from this defect to see the objects clearly?
Akshay, sitting in the last row in his class, could not see clearly the words written on the blackboard. When the teacher noticed it, he announced if any student sitting in the front row could volunteer to exchange his seat with Akshay. Salman immediately agreed to exchange his seat with Akshay. He could now see the words written on the blackboard clearly. The teacher thought it fit to send the message to Akshay s parents advising them to get his eyesight checked. In the context of the above event, answer the following questions:
(a) Which defect of vision is Akshay suffering from? Which type of lens is used to correct this defect?
(b) State the values displayed by the teacher and Salman.
(c) In your opinion, in what way can Akshay
express his gratitude towards the teacher and Salman? (VBQ, AI 2015)

Question 21. 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. (VBQ, 3/5, Foreign 2015)
Answer:
Refer to answer 18.

Question 22. 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? (2/5, AI 2014)

Question 23. What is myopia? List two causes for the development of this defect? How can this defect be corrected using a lens? Draw ray diagrams to show the image formation in case (i) defective eye and (ii) corrected eye. (Foreign 2014)

Question 24. (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 newspapers. Write the importance of such advertisements. (Delhi 2013)

Question 25. A student cannot see a chart hanging on a wall placed at a distance of 3 m from him. Name the defect of vision he is suffering from. How can it be corrected? Draw ray diagrams for the (i) defect of vision and also

(ii) for its correction. (Delhi 2012)

Question 26. An old man cannot see objects closer than 1 m from the eye clearly. Name the defect of vision he is suffering from. How can it be corrected? Draw ray diagram for the (i) defect of vision and also (ii) for its correction. (AI 2012)

Question 27. Draw a diagram to show why distant objects cannot be seen distinctly by a myopic eye. List two reasons due to which this defect of vision may be caused.
A person with a myopic eye cannot see objects clearly beyond a distance of 2 m. Name the type of the corrective lens that would be needed to correct the defect of vision and draw a ray diagram to show how the defect gets corrected. (Foreign 2012)

Question 28. Draw a ray diagram to show the refraction of light through a glass prism. Mark on it (a) the incident ray, (b) the emergent ray and (c) the angle of deviation. (AI 2011)

Question 29. Draw a ray diagram to explain the term angle of deviation. (1/5, Delhi 2017)

Question 30. Draw a labelled diagram to explain the formation of a rainbow in the sky. (Foreign 2015)

Question 31. How will you use two identical glass prisms so that a narrow beam of white light incident on one prism emerges out of the second prism as white light? Draw and label the ray diagram. (2020)

Question 32. Differentiate between a glass slab and a glass prism. What happens when a narrow beam of
(i) a monochromatic light and (ii) white light passes through (a) glass slab and (b) glass prism? (2020)

Question 33. (a) With the help of labelled ray diagram show the path followed by a narrow beam of monochromatic light when it passes through a glass prism.
(b) What would happen if this beam is replaced by a narrow beam of white light? (2020)

Question 34. What is rainbow? Draw a labelled diagram to show the formation of a rainbow. (Delhi 2019)

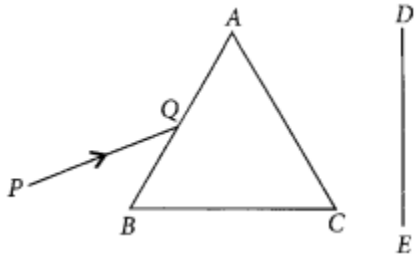
Question 35. What is ‘dispersion of white light’? State its cause. Draw a ray diagram to show the dispersion of white light by a glass prism. (AI 2017)

Question 36. State the cause of dispersion of white light passing through a glass prism. How did Newton showed 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. (Delhi 2016)

Question 37. 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 diagrams to

show the recombination of the spectrum of white light. (AI 2016)

Question 38. A narrow 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.



(i) Write the name and cause of the phenomenon observed.
(ii) Where else in nature is this phenomenon observed?
(iii) Based on this observation, state the conclusion which can be drawn about the constituents of white light. (AI 2014)

Question 39. Define the term dispersion of white light. Name the colour of light which bends (i) the most, (ii) the least while passing through a glass prism. Draw a ray diagram to justify your answer. (Foreign 2014)

Question 40. What is a spectrum? How can we recombine the components of white light after a glass prism has separated them? Illustrate it by drawing a diagram. (Foreign 2014)

Question 41. When we place a glass prism in the path of a narrow beam of white light, a spectrum is obtained. What happens when a second identical prism is placed in an inverted position with respect to the first prism? Draw a labelled diagram to illustrate it. (Delhi 2012)

Question 42. Draw a labelled ray diagram to illustrate the dispersion of a narrow beam of white light when it passes through a glass prism. (AI 2012)

Question 43. Draw a ray diagram to show the formation of a rainbow and mark the point where (i) dispersion, (ii) internal reflection occurs. (Foreign 2012)

Question 44. What is meant by the dispersion of white light? Draw a diagram to show dispersion of white light by the glass prism. (Delhi 2011)

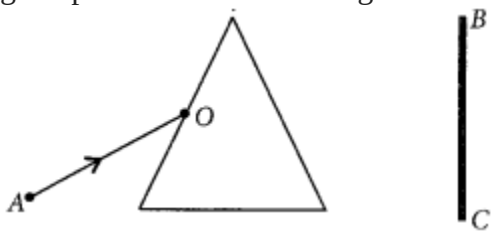
Question 45. Explain the formation of rainbow in the sky with the help of a diagram. (Foreign 2011)

Question 46. Give reasons:
(i) The extent of deviation of a ray of light on passing through a prism depends on the colour.
(ii) Lights of red colour are used for danger signals. (Foreign 2011)

Question 47. (a) Why do the component colours of incident white light split into a spectrum while passing through a glass prism, explain.
(b) Draw a labelled ray diagram to show the formation of a rainbow. (4/5, Delhi 2017)

Question 48. (a) What is dispersion of white light? State its cause.
(b) "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. (Foreign 2016)

Question 49. (a) Trace on your answer sheet the path of a monochromatic ray AO incident on a glass prism and mark the angle of deviation.



(b) If AO were a ray of white light,
(i) describe what will you observe on the screen BC placed near the prism
(ii) write the name of this phenomenon
(iii) state the cause of this phenomenon
(iv) what does it prove about the constituents of white light? (Delhi 2013 C)

Question 50. Why do stars appear to twinkle ? Explain. (Foreign 2015)

Question 51. Explain why the planets do not twinkle. (Foreign 2015)

Question 52. Explain in brief the reason for each of the following:
(a) Advanced sun-rise
(b) Delayed sun-set
(c) Twinkling of stars (Foreign 2016)

Question 53. What is meant by advance sunrise and delayed sunset? Draw a labelled diagram to explain these phenomena. (Foreign 2015)

Question 54. Explain with the help of a labelled diagram, the cause of twinkling of stars. (Delhi 2014)

Question 55. A star sometimes appears brighter and some other times fainter. What is this effect called? State the reason for this effect. (Delhi 2012)

Question 56. A star appears slightly higher (above) than its actual position in the sky. Illustrate it with the help of a labelled diagram. (AI2012)
normal, the star appears slightly above than its actual position.

Question 57. “The time difference between the actual sunset and the apparent sunset is about 2 minutes” What is the reason for the same? Explain with the help of a diagram. (Foreign 2012)

Question 58. Explain why the planets do not twinkle but the stars twinkle. (Delhi 2011)

Question 59. Why do stars twinkle ? Explain (2/3, 2018)

Question 60. What is atmospheric refraction? Use this phenomenon to explain the following natural events.
(a) Twinkling of stars
(b) Advanced sun-rise and delayed sun-set. Draw diagrams to illustrate your answers. (AI 2016)

Question 61. The sky appears dark to passengers flying at very high altitudes mainly because
(a) Scattering of light is not enough at such heights.
(b) There is no atmosphere at great heights.
(c) The size of molecules is smaller than the wavelength of visible light.
(d) The light gets scattered towards the earth. (2020)

Question 62. Consider the following reasons for the reddish appearance of the sun at the sunrise or the sunset:
(A) Light from the sun near the horizon passes through thinner layers of air.
(B) Light from the sun covers larger distance of the earths atmosphere before reaching our eyes.
(C) Near the horizon, most of the blue light and shorter wavelengths are scattered away by the particles.
(D) Light from the sun near the horizon passes through thicker layers of air.
The correct reasons are
(a) A and C only
(b) B, C and D
(c) A and B only
(d) C and D only (2020)

Question 63. What will be the colour of the sky when it is observed from a place in the absence of any atmosphere? (Delhi 2012)

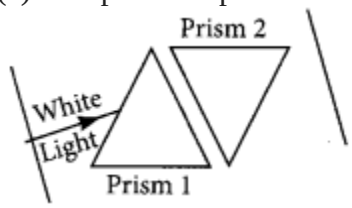
Question 64. Give an example of a phenomenon where Tyndall effect can be observed. (AI 2011)

Question 65.
Why is the colour of clear sky blue? (Foreign 2011)

Question 66. Why is Tyndall effect shown by colloidal particles? State four instance of observing the Tyndall effect. (2020)

Question 67. Draw a labelled diagram to show (i) reddish appearance of the sun at the sunrise or the sunset and (ii) white appearance of the sun at noon when it is overhead. (2020)

Question 68. (a) State the relation between colour of scattered light and size of the scattering particle.
(b) The apparent position of an object, when seen through the hot air, fluctuates or waves. State the basic cause of this observation.
(c) Complete the path of white light when it passes through two identical prisms placed as shown



Question 69. With the help of a labelled diagram, explain why the sun appears reddish at the sun-rise and the sun-set. (Delhi 2015)

Question 70. 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. (AI 2015)

Question 71. 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. (Foreign 2015)

Question 72. State the difference in colours of the sun observed during sunrise/sunset and noon. Give explanation for each. (Delhi 2013)

Question 73. Why does the sun appear reddish early in the morning? Will this phenomenon be observed by an astronaut on the Moon? Give reason to justify your answer. (3/5, 2018)