

# **HUMAN EYE AND COLOURFUL WORLD**

## **IMPORTANT QUESTIONS**

### **1 Mark Questions**

- Q.1. What is the defect from which the eye shown in the figure suffers?
- Q.2. The image of an object near the eye is being formed at I, as shown. Name the defect from which the eye suffers.
- Q.3. Complete the given diagram for a corrected myopic eye. Where are the far point and the near point for such an eye?
- Q.4. Complete the given fig. for a hypermetropic eye. Mark the near point and the far point of such an eye.
- Q.5. In fig below, three cases of a ray of light passing through a prism. Which of these rays is suffering minimum deviation ?
- Q.6. Figure shows a ray of white light suffering dispersion. Correct the diagram if you feel it needs correction and redraw it.
- Q.7. What is meant by power of accommodation of the eye ?
- Q.8. What is the far point and near point of the human eye with normal vision?
- Q.9. 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?
- Q.10. Why is a normal eye not able to see clearly the objects placed closer than 25 cm?
- Q.11. What happens to the image distance in the eye when we increase the distance of an object from the eye?
- Q.12. Why does the sky appear dark instead of blue to an astronaut?
- Q.13. Name the essential parts of human eye.
- Q.14. What is cornea?
- Q.15. Which liquid fills the space behind the cornea?
- Q.16. What is iris?
- Q.17. Which part of the eye controls the amount of light entering the eye?

- Q.18. What is eye lens made of ? Ans. It is made of a jelly like material.
- Q.19. How is the eye lens held in its position?
- Q.20. How is the sense of vision carried from the eye to the brain?
- Q.21. Which liquid fills the space between eye lens and retina?
- Q.22. What is a blind spot?
- Q.23. What is meant by far point?
- Q.24. What is the far point of a normal human eye?
- Q.25. What is meant by near point ?
- Q.26. What is meant by least distance of distinct vision?
- Q.27. How is near sightedness corrected?
- Q.28. How is long sightedness corrected?
- Q.29. What is astigmatism?
- Q.30. How is astigmatism corrected?
- Q.31. A person has to use a concave lens in his spectacles. Which defect of vision is he suffering from?
- Q.32. Why can you not see an object clearly if it is placed very close to your eye?
- Q.33. When you enter from a bright sun shine into a dark room, you are not able to see clearly for sometime, why?
- Q.34. Sometimes you see a person reading the newspaper by placing it very close to his eyes. Which defect is he suffering from? How can the defect be removed?
- Q.35. Sometime you see a person reading the newspaper by placing it far away from his eyes, which defect is he suffering from? How can the defect be removed?
- Q.36. What is presbyopia?
- Q.37. What is twinkling of stars due to?
- Q.38. Define dispersion of white light.
- Q.39. Give one example in nature where we can see dispersion of white light.

- Q.40. What kind of lens is used in the spectacles of a person suffering from myopia (near sightedness) ?
- Q.41. In myopia, what happens to the power of the eye lens?
- Q.42. Why does sky look blue on a clear day?

## 2 AND 5 MARKS QUESTIONS

- Q.1. In the fig. is shown the diagram of the human eye. Name the marked points.
- Q.3. What is an achromatic combination of prism? Draw the course of rays through such a combination.
- Q.2. The figure shows the refraction of light through an equilateral prism, incident at an angle of  $30^\circ$ . The ray suffers a deviation of  $37^\circ$ . What are the angles marked as A, e and / respectively?
- Q.4. What are the factors on which the deviation produced by a prism depends ?
- Q.5. What is Tyndall effect?
- Q.6. State whether the following statements are correct or not. Justify your answer :
- a) Short sightedness can be cured by using a concave lens.
  - b) Long sightedness can be cured by using a convex lens.
- Q.7. Are colour blindness and presbyopia the same or different. How are they cured?
- Q.8. What are rod shaped and cone shaped cells? How do they help us in seeing colour ?
- Q.9. What is hypermetropia? State the two causes. With the help of ray diagrams, show (i) the eye defect hypermetropia (ii) correction of hypermetropia by using a lens.
- Q.10. Study the diagram given below and answer the questions that follow it : a) Which defect of vision is represented here? Give reason for your answer.
- b) Draw ray diagram to show the correction of this defect by the use of a suitable lens.
- Q.11. Why does the sky look blue on a sunny day? Explain.

Q.12. The stars appear to twinkle while planets do not. Why?

Q.13. What is dispersion of light ? Name the :

- (i) component of white light that deviates the least and
- (ii) the component that deviates the most while passing through a glass prism.

Q.14. A student sitting at the back of a class is not able to see what is written on the blackboard. He however, sees it clearly when sitting on the front seat at an approximate distance of 1.5 m from the blackboard. Draw ray diagrams to illustrate the image formation of the blackboard writing by eye lens when he is seated at:

- (i) the back seat (ii) front seat.

Q.15. Give reasons for the following :

- (i) The sun appears reddish at sunrise or sunset.
- (ii) The sky appears dark instead of blue to an astronaut.

Q.16. What is meant by spectrum? How can we combine the components of white light after a prism has separated them?

Q.17. What is scattering of light? The colour of sun looks different at different times of the day. Why?

Q.18. What are hypermetropia and myopia? What is their cause? How are they rectified?

Q.19. Why does dispersion of white light occur?

Q.20. What is colour blindness?

Q.21. What is meant by persistence of vision?

Q.22. List four common defects of vision that can be corrected with the use of spectacles.

Q.23. (a) What will be colour of the sky in the absence of atmosphere?

(b) Why are the traffic light signals (or danger signals) of red colour?

Q.24. (a) State two main causes of a person developing near sightedness. How can this defect be corrected? (b) What is 'astigmatism' and how is this vision defect corrected?

Q.25. (a) How does the sky appear dark from the surface of the moon?

(b) What is the cause of blue colour of the ocean?

Q.26. Make a diagram to show how hypermetropia is corrected. The near point of a hypermetropia eye is 1 metre. What is the power of the lens required to correct this defect? Assume that the near point of the normal eye is 25 cm.

Q.27. Why does the sun appear reddish early in the morning?

## 5 MARKS QUESTIONS

- Q.1. (a) What is myopia? State the two causes of myopia. With the help of labelled ray diagrams show :
- (i) the eye defect myopia.
  - (ii) correction of myopia using a lens.
- (b) Why is a normal eye unable to focus on an object placed within 10 cm from the eye?
- Q.2. (a) What is dispersion of white light? What is the cause of such dispersion? Draw a diagram, to show the dispersion of white light by a glass prism.
- (b) A glass prism is able to produce a spectrum when white light passes through it but a glass slab does not produce any spectrum. Explain why it is so.

## Hots Higher Order Thinking Skills Questions

- Q.1. A child sitting in a classroom is not able to read clearly the writing on the blackboard.
- a) Name the type of defect from which his eye is suffering.
  - b) With the help of a ray diagram show how this defect can be remedied?
- Q.2. Why we have two eyes instead of one ?
- Q.3. When one enters a dim-lit room from bright light, one is unable to see the object in the room for sometime. Explain, why?
- Q.4. A person is able to see objects clearly only when these are lying at distances between 50 cm and 300 cm from his eye.
- a) What kind of defect of vision is he suffering from?
  - b) What kind of lenses will he required to increase his range of vision from 25 cm to infinity? Explain.
- Q.5. A student cannot read properly from the blackboard while sitting on the front desk in a classroom of a big size. He however, can read clearly while sitting on the last desk of the classroom.

- a) Draw ray diagrams to illustrate the formation of image of the blackboard writing by his eye lens when he is seated at the (i) front desk, (ii) last desk.
  - b) Name the defect of the eye from which the student is suffering.
  - c) Name the type of lens that would enable him to see the blackboard writing clearly, when seated on the front desk. Draw a ray diagram to illustrate how this lens helps him to see clearly.
- Q.6. A student finds the writing on the blackboard blurred and unclear while sitting on the last desk in a classroom. He however, sees it clearly while sitting on the front desk at about 2 m from the blackboard.
- a) Draw ray diagrams to illustrate the formation of image of the blackboard writing by his eye lens when he is seated at the (i) last desk (ii) front desk.
  - b) Name the kind of lens that would help him to see clearly even when he is seated at the last desk. Draw a ray diagram to illustrate how this lens helps him to see clearly.
- Q.7. A prism causes dispersion of white light while a rectangular glass block does not. Explain.
- Q.8. A beam of white light falling on a glass prism gets split up into seven colours marked 1 to 7 as shown in the diagram. A student makes the following statements about the spectrum observed on the screen.
- a) The colours at position marked 3 and 5 are similar to the colour of the core of a hard-boiled egg colour and the colour of the sky respectively. Is the statement made by the student correct or incorrect? Justify.
  - b) Which of the two positions correspond closely to the colour of (i) a solution of potassium permanganate (ii) danger or stop signal lights?
- Q.9. Figure below shows the refraction of a ray through a prism. Copy the diagram and ignoring dispersion at the faces AB and AC. Mark the following angles : (i) The angle of incidence, (ii) The angle of refraction at the face AB (iii) The angle of emergence, (iv) The angle of deviation.
- Q.10. Figure below shows a glass prism placed in minimum deviation position. A ray of monochromatic light is incident on its face AB. Copy the diagram and show

the refracted and the emergent ray. Mark the angle of deviation. State any two factors on which the angle of deviation depends.

- Q.11. In the given figure, a ray of light PQ is incident normally on one face AB of an equilateral glass prism. What are the angles at faces AB and AC?
- Q.12. A glass slab is placed over a page on which the word VIBGYOR is printed *with each letter in its corresponding colour*, (i) Will the image of all the letters be in the same place? (ii) If not, state which letter will be raised to the maximum. Give a reason for your answer.
- Q.13. A prism causes dispersion of white light while a rectangular glass block does not. Explain.
- Q.14. Write approximate wavelengths for (i) blue and (ii) red light. Which colour has the higher speed in vacuum? Which colour has the higher speed in glass?



## Reasoning Questions

- Q.1. A person can see clearly and read the hoardings on the roadside but is not able to read a book.
- a) From which defect of the eye is he suffering ?
  - b) What type of the spectacle lens should be use to correct the defect?
- Q.2. A short sighted person can read printed clearly held at a distance of 15 cm from the eye. He wants to read a book kept at a distance of 60 cm from the eye. What is the nature and focal length of the lens he requires?
- Q.3. A hypermetropic eye can be corrected by using a convex lens of a suitable focal length. Explain.
- Q.4. Under what conditions, the use of bifocal spectacles is recommended ?
- Q.5. A ray of light is incident on a prism in the minimum deviation position as shown and it suffers a deviation of  $40^\circ$ . What will be the deviation suffered if the shaded half of the prism is removed ?
- Q.6. Why is that white light passing through a prism is split into its constituent colours although in air it travels as a single ray?
- Q.7. Why is the order of colours reversed in a secondary rainbow from that in the primary rainbow?
- Q.8. Arrange the names of the following colours : Yellow, Green, Blue, Red.
- (i) in increasing order of their frequencies.
  - (ii) in increasing order of their wavelengths.
- Q.9. Mention the names of the colours in the spectrum of sunlight having minimum and maximum frequencies.

### Numerical Problems

- Q.1. A person with a defective eye vision is unable to see the objects nearer than 1.5 m. He wants to read books at a distance of 30 cm. Find the nature, focal length and power of the lens he needs in his spectacles.
- Q.2. The far point of a myopic person 80 cm in front of the eyes. What is the nature and power of the lens required to enable him to see very distant objects distinctly ?
- Q.3. Far point of a myopic person is 40 cm. What type of lens should he wear so as to see the distant object clearly? Calculate the focal length and the power of the lens he should use.
- Q.4. A myopic person has been using spectacles of power -1.00 D for clear vision. During old age he also needs to use separate reading glasses of power + 2.00 D. Explain what may have happened to his eyesight ?
- Q.5. The far point of a myopic person is 150 cm in front of the eye. Calculate the focal length and the power of a lens required to enable him to see distant objects clearly.
- Q.6. A person needs a lens of power - 5.5 D for correcting his distant vision. For correcting his near vision, he needs a lens of power + 1.5 D. What is the focal length of the lens required for correcting :
- (i) distant vision                      (ii) near vision?
- Q.7. 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?

**CHEMISTRY**  
**CARBON AND ITS COMPOUNDS**

**1. mark questions**

1. Name of the organic compound, which can be produced by fermentation of sugar and is a constituent of beer.
2. Name the main products formed when :
  - (i) Ethanol is oxidized by an alkaline solution of  $\text{KMnO}_4$
  - (ii) Ethanol is heated with conc.  $\text{H}_2\text{SO}_4$
3. What is denatured alcohol
4. Name the product formed besides soap that is obtained during saponification process.
5. The molecular formula of the consecutive members of a homologous are  $\text{C}_6\text{H}_{14}$  and  $\text{C}_7\text{H}_{16}$ . Write the molecular formulae of members having 9 and 11 carbon atoms of this homologous series.
6. Write the names of functional groups present in (a) ethanol (b) ethanoic acid.
7. The structural formula of an ester is  $\text{C}_2\text{H}_5\text{COOH}_3$   
Write the molecular formula of the alcohol and acid from which it would have been formed.
8. The molecular formulae of two members of a homologous series are  $\text{C}_3\text{H}_4$  and  $\text{C}_6\text{H}_{10}$
9. Which of the following belonging to the same homologous series ? Why ?  $\text{C}_3\text{H}_8$ ,  $\text{C}_3\text{H}_6$ ,  $\text{C}_4\text{H}_8$ ,  $\text{C}_4\text{H}_6$ .
10. What are addition reactions ? Give example
11. What is the difference between two consecutive members of a homologous series.
  - (i) in terms of molar mass
  - (ii) in terms of number and kind of atoms ?
12. Complete the equation :  $\text{C}_2\text{H}_5\text{COOH} + \text{NaOH} \xrightarrow{\text{heat}}$
13. What type of bonds are present in hydrocarbons ? Why are they insoluble in water ?