

PRACTICE PAPER 01 (2026-27)
CHAPTER 10: THE HUMAN EYE AND THE COLOURFUL WORLD

SUBJECT: SCIENCE

MAX. MARKS : 40

CLASS : X

DURATION : 1½ hrs

General Instructions:

- (i) All questions are compulsory.
- (ii) This question paper contains **20** questions divided into five Sections A, B, C, D and E.
- (iii) **Section A** comprises 10 MCQs and Assertion-Reason questions of **1 mark** each. **Section B** comprises 4 Very Short Answer questions of **2 marks** each. **Section C** comprises 3 Short Answer questions of **3 marks** each. **Section D** comprises 1 Long Answer question of **5 marks**. **Section E** comprises 2 Case Study Based questions of **4 marks** each.
- (iv) There is no overall choice. Internal choice is provided in Section E.
- (v) Use of calculators is not permitted.

SECTION - A

Questions 1 to 10 carry 1 mark each.

1. Most of the refraction of light rays entering the human eye takes place at the
 - (a) crystalline lens
 - (b) outer surface of the cornea
 - (c) pupil
 - (d) retina
2. The part of the eye that controls the size of the pupil is the
 - (a) cornea
 - (b) retina
 - (c) iris
 - (d) ciliary muscles
3. For a young adult with normal vision, the near point and the far point of the eye are respectively
 - (a) 25 m and infinity
 - (b) 25 cm and 25 m
 - (c) 25 cm and infinity
 - (d) 2.5 cm and 25 cm
4. When we look at a nearby object, the ciliary muscles
 - (a) relax and the eye lens becomes thinner
 - (b) contract and the focal length of the eye lens increases
 - (c) contract and the eye lens becomes thicker
 - (d) relax and the focal length decreases
5. In an eye, the image of a distant object is formed in front of the retina. The defect and the lens needed to correct it are
 - (a) myopia - concave lens
 - (b) myopia - convex lens
 - (c) hypermetropia - convex lens
 - (d) presbyopia - concave lens
6. In a common type of bi-focal lens, the upper portion is a
 - (a) convex lens, for near vision
 - (b) concave lens, for distant vision
 - (c) convex lens, for distant vision
 - (d) concave lens, for near vision
7. When white light passes through a glass prism, the colour that bends the least is
 - (a) violet
 - (b) blue
 - (c) green
 - (d) red

8. 'Danger' signal lights are red in colour because red light
- (a) is scattered the most by fog or smoke
 - (b) is scattered the least by fog or smoke
 - (c) has the shortest wavelength
 - (d) is absorbed by air molecules

In the following questions 9 and 10, a statement of Assertion (A) is followed by a statement of Reason (R). Mark the correct choice as:

- (a) Both (A) and (R) are true and (R) is the correct explanation of (A).
- (b) Both (A) and (R) are true but (R) is not the correct explanation of (A).
- (c) (A) is true but (R) is false.
- (d) (A) is false but (R) is true.

9. **Assertion (A):** Planets do not twinkle.

Reason (R): Planets are seen as extended sources, and the variations in light from their many point-sized sources average out to zero.

10. **Assertion (A):** The sky appears dark to passengers flying at very high altitudes.

Reason (R): Air molecules scatter red light more strongly than blue light.

SECTION - B

Questions 11 to 14 carry 2 marks each.

- 11. What is meant by the power of accommodation of the eye? How do the ciliary muscles help us see (a) a distant object and (b) a nearby object clearly?
- 12. A student cannot see objects beyond 2 m clearly. Name the defect of vision. Find the nature and power of the lens needed to correct it.
- 13. Explain how a rainbow is formed. In which direction is it seen with respect to the Sun?
- 14. The Sun is visible to us about 2 minutes before actual sunrise and about 2 minutes after actual sunset. Explain why. Name one other effect due to the same cause.

SECTION - C

Questions 15 to 17 carry 3 marks each.

- 15. (a) What is hypermetropia? State its two possible causes.
(b) The near point of a hypermetropic eye is 50 cm. Find the nature and power of the lens required to correct this defect. (Near point of a normal eye = 25 cm)
- 16. (a) Why do stars twinkle?
(b) Why does a star appear slightly higher than its actual position when seen near the horizon?
- 17. Write the function of each of the following parts of the human eye: (a) cornea (b) iris (c) pupil (d) retina (e) optic nerve (f) crystalline lens.

SECTION - D

Question 18 carries 5 marks.

- 18. (a) What is myopia? State its two possible causes. With the help of ray diagrams, show (i) a myopic eye and (ii) its correction.
(b) What is presbyopia and why does it occur? How do bi-focal lenses help?
(c) A person needs a lens of power -4.0 D to correct distant vision and $+2.0$ D for near vision. Find the focal lengths of the two lenses.

SECTION - E (Case Study Based Questions)

Questions 19 and 20 carry 4 marks each.

- 19.** A student traced the path of a ray of light through a triangular glass prism ABC using pins, as shown below.

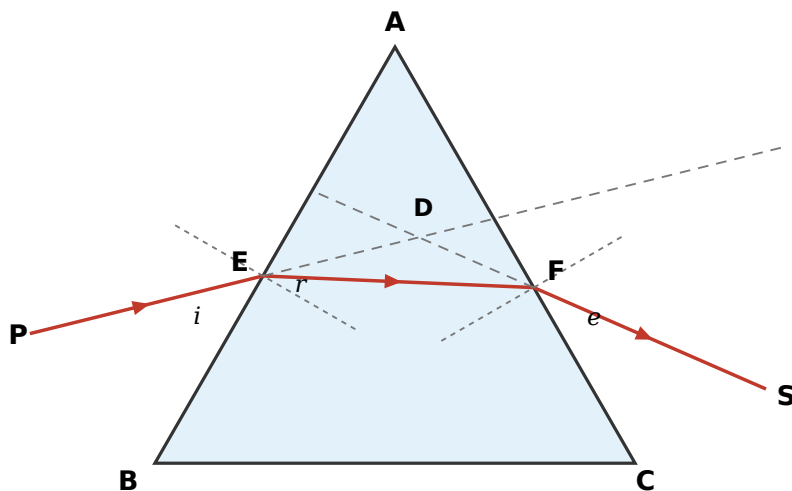


Figure: Refraction of light through a triangular glass prism

- (a) Name the incident ray, the refracted ray and the emergent ray. **(1)**
- (b) What is the angle marked D called? At which face does the ray bend away from the normal, and why? **(1)**
- (c) If a narrow beam of white light is used instead, what will be seen on a screen beyond the prism? Name the phenomenon and explain why it happens. **(2)**

OR

- (c) Describe Newton's experiment with two identical prisms. What did it show about sunlight? **(2)**

- 20.** Read the passage and answer the questions that follow.

The earth's atmosphere is a heterogeneous mixture of smoke, tiny water droplets, dust and molecules of air. When a fine beam of sunlight enters a smoke-filled room through a small hole, its path becomes visible. The colour of the light scattered depends on the size of the scattering particles. Air molecules are smaller than the wavelength of visible light and scatter shorter wavelengths more strongly. An astronaut in space, however, sees a dark sky.

- (a) Name the phenomenon that makes the path of the beam visible in the smoke-filled room. Give one more natural example. **(1)**
- (b) How does the colour of scattered light depend on the size of the scattering particles? **(1)**
- (c) Explain why the clear sky appears blue to us but dark to the astronaut. **(2)**

OR

- (c) If the earth had no atmosphere, how would the sky appear during the day, and how would the time of sunrise and sunset be affected? **(2)**