CBSE CLASS X

Science (086)

QUESTION PAPER

AI-generated question paper

Code: EHEN6D	Questions: 36	Maximum Marks: 76	Generated: 2026-06-25 17:46

SELECTIONS USED

Subject	Science
Lessons	10 The Human Eye and the Colourful World
Level of understanding	Exam-ready
Question selection	CBSE board paper, whole lesson (~80 marks across Sections A-E)
Model	claude-sonnet-4-6

Composition — Difficulty: 15 straightforward · 14 medium · 7 deep | Types: 13 MCQ · 7 Short · 5 Assertion–reason · 5 Very short · 3 Long · 3 Case-based | Sections: A 18Q/18m · B 5Q/10m · C 7Q/21m · D 3Q/15m · E 3Q/12m

Q1. straightforward exam-ready **[1]**

A person can see nearby objects clearly but has difficulty seeing distant objects. Which type of lens is used to correct this defect?

A Convex lens
B Concave lens
C Bifocal lens
D Cylindrical lens

◆ **The Human Eye and the Colourful World**

Q2. straightforward exam-ready **[1]**

The part of the human eye that is responsible for most of the refraction of incoming light is the:

A Eye lens
B Retina
C Cornea
D Ciliary muscles

◆ **The Human Eye and the Colourful World**

Q3. straightforward exam-ready **[1]**

When white light passes through a glass prism, the colour that deviates the LEAST is:

A Violet
B Blue
C Green
D Red

◆ **The Human Eye and the Colourful World**

Q4. straightforward exam-ready **[1]**

The correct sequence of colours in the spectrum of white light from the least deviated to the most deviated is:

A Violet, Indigo, Blue, Green, Yellow, Orange, Red
B Red, Orange, Yellow, Green, Blue, Indigo, Violet
C Red, Green, Violet, Yellow, Orange, Indigo, Blue
D Violet, Blue, Green, Red, Orange, Yellow, Indigo

◆ **The Human Eye and the Colourful World**

Q5. medium exam-ready **[1]**

Stars twinkle at night but planets do not. The most accurate reason for this difference is:

A Planets emit their own light while stars do not
B Planets are much closer to Earth and act as extended sources, so light variations average out
C Stars are hotter than planets and so their light fluctuates more
D Planets move faster across the sky, reducing the twinkling effect

◆ **The Human Eye and the Colourful World**

Q6. medium exam-ready **[1]**

A rainbow is always observed in the direction opposite to the Sun. Which set of optical phenomena is responsible for its formation?

A Refraction and scattering
B Dispersion, internal reflection and refraction
C Reflection and diffraction
D Scattering and total internal reflection

◆ **The Human Eye and the Colourful World**

Q7. medium exam-ready **[1]**

The sky appears dark to astronauts flying at very high altitudes because:

A Sunlight does not reach very high altitudes
B At such altitudes, the atmosphere is too cold to scatter light
C Scattering of sunlight by air particles is not prominent at such heights
D The Sun's rays are parallel at great heights and do not spread

◆ **The Human Eye and the Colourful World**

Q8. straightforward exam-ready **[1]**

In hypermetropia, the image of a nearby object is formed:

A In front of the retina
B On the retina
C Behind the retina
D On the cornea

◆ **The Human Eye and the Colourful World**

Q9. straightforward exam-ready **[1]**

Bifocal lenses are commonly prescribed for people suffering from:

A Myopia only
B Hypermetropia only
C Both myopia and hypermetropia simultaneously
D Cataract

◆ **The Human Eye and the Colourful World**

Q10. straightforward exam-ready **[1]**

Which colour of light is scattered the MOST by fine particles in the earth's atmosphere?

A Red
B Green
C Yellow
D Blue

◆ **The Human Eye and the Colourful World**

Q11. medium exam-ready **[1]**

The Sun is visible to us about 2 minutes before actual sunrise. This is due to:

A Scattering of sunlight
B Atmospheric refraction
C Dispersion of sunlight
D Reflection from the ionosphere

◆ **The Human Eye and the Colourful World**

Q12. straightforward exam-ready **[1]**

The angle between the emergent ray and the direction of the incident ray when light passes through a prism is called the:

A Angle of prism
B Angle of refraction
C Angle of deviation
D Critical angle

◆ **The Human Eye and the Colourful World**

Q13. straightforward exam-ready **[1]**

The condition in which the crystalline lens of the eye becomes milky and cloudy, causing partial or complete loss of vision, is known as:

A Myopia
B Presbyopia
C Astigmatism
D Cataract

◆ **The Human Eye and the Colourful World**

Q14. medium exam-ready **[1]**

Assertion (A): Red light is used for danger signals at airports and on tall buildings.
Reason (R): Red light has the longest wavelength among visible colours and is scattered the least by fog or smoke.

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

◆ The Human Eye and the Colourful World

Q15. medium exam-ready **[1]**

Assertion (A): When the ciliary muscles of the eye relax, the eye lens becomes thin and its focal length increases.
Reason (R): A thinner lens has less curvature, which decreases its converging power and allows the eye to focus on distant objects.

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

◆ The Human Eye and the Colourful World

Q16. deep exam-ready **[1]**

Assertion (A): The apparent position of a star near the horizon is slightly higher than its actual position.
Reason (R): The earth's atmosphere refracts starlight, bending it towards the normal as it passes through layers of increasing density.

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

◆ The Human Eye and the Colourful World

Q17. medium exam-ready **[1]**

Assertion (A): White light passing through a second prism placed in an inverted position relative to the first prism emerges as white light again.
Reason (R): The second prism recombines the dispersed colours back into white light.

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

◆ The Human Eye and the Colourful World

Q18. deep exam-ready **[1]**

Assertion (A): Objects seen through a column of hot air rising above a fire appear to waver.
Reason (R): The hot air above a fire is less dense than the surrounding cooler air, creating continuously changing refractive index layers that cause light to bend irregularly, making the objects appear to shimmer.

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

◆ The Human Eye and the Colourful World

Q19. straightforward exam-ready **[2]**

State two causes that can lead to the development of myopia in a human eye.

◆ The Human Eye and the Colourful World

Q20. straightforward exam-ready **[2]**

What is the Tyndall effect? Give one example from nature where this phenomenon can be observed.

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Q21. medium exam-ready **[2]**

Explain why the Sun appears reddish at sunrise and sunset but appears white or yellow-white at noon.

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Q22. straightforward exam-ready **[2]**

What is the far point of a normal human eye? How does this differ in a person with myopia?

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Q23. straightforward exam-ready **[2]**

The power of accommodation of a person's eye gradually decreases as they grow older. Name this condition and state TWO reasons for its occurrence.

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Q24. medium exam-ready **[3]**

Draw a labelled ray diagram showing how a concave lens corrects myopia in a person whose far point is closer than infinity. Your diagram must show the position of the image before and after correction.

◆ The Human Eye and the Colourful World

Q25. straightforward exam-ready **[3]**

The human eye has several specialised parts that work together to form a clear image. Explain the specific function of each of the following, stating what would happen if each part were absent or damaged: (i) Cornea, (ii) Iris, (iii) Retina.

◆ The Human Eye and the Colourful World

Q26. straightforward exam-ready **[3]**

When white light is passed through a glass prism, a band of colours is observed on a screen placed on the other side. (i) Name this band and the phenomenon responsible for its formation. (ii) Explain why different colours emerge at different angles from the prism, and identify which colour undergoes the maximum and minimum deviation.

◆ The Human Eye and the Colourful World

Q27. medium exam-ready **[3]**

Explain why stars twinkle on a clear night. Your answer must include the role of the earth's atmosphere and the nature of stars as light sources.

◆ The Human Eye and the Colourful World

Q28. deep exam-ready **[3]**

A hypermetropic person has a near point of 1.5 m. Calculate the power of the corrective lens needed so that she can read a book placed at 25 cm from her eyes.

◆ The Human Eye and the Colourful World

Q29. medium exam-ready **[3]**

What is atmospheric refraction? How does it cause the apparent shift in the position of stars near the horizon? Why is this effect more pronounced near the horizon than overhead?

◆ The Human Eye and the Colourful World

Q30. deep exam-ready **[3]**

Differentiate between dispersion and scattering of light. How does the size of particles determine the colour of scattered light?

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Q31. medium exam-ready **[5]**

(a) With the help of a labelled ray diagram, explain the defect of hypermetropia, showing where the image is formed in a hypermetropic eye.
(b) Show how the defect is corrected using an appropriate lens.
(c) State TWO possible structural reasons why this defect develops.

◆ The Human Eye and the Colourful World

Q32. deep exam-ready **[5]**

(a) What is meant by the dispersion of white light? With the help of a labelled diagram, show how a glass prism disperses white light into its constituent colours.
(b) Describe the experiment that proved sunlight is composed of seven colours, including the role of a second inverted prism placed in the path of the dispersed light.
(c) Using the concept of dispersion, explain in detail how a rainbow is formed in the sky after a rain shower. Draw a labelled diagram showing the path of light through a single water droplet.

◆ The Human Eye and the Colourful World

Q33. deep exam-ready **[5]**

(a) Define the power of accommodation of the human eye. How do the ciliary muscles bring about this accommodation when viewing a nearby object versus a distant object?
(b) A myopic person's far point is 2 m. Calculate the power of the lens he needs to see distant objects clearly.
(c) With increasing age, a person finds that the range of clear vision becomes very restricted — she cannot see near objects or far objects without glasses. Name the defect and describe the type of lens used to correct it.

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Q34. medium exam-ready **[4]**

Read the following and answer the questions that follow:

Rahul, a Class 10 student, notices that when sunlight enters his room through a small gap in the curtains, he can clearly see dust particles floating in the air along the beam. During a science fair, he sets up a glass tank filled with a colloidal suspension of dilute milk in water and shines a torch through it — the beam is clearly visible from the side. He recalls that a similar effect is seen when sunlight filters through the canopy of a dense forest on a misty morning.

(i) Name the phenomenon Rahul observes in all three situations. [1]
(ii) Why is the path of light visible through the colloidal suspension but not through a true (clear) solution? [1]
(iii) How does the size of scattering particles determine the colour of scattered light? [2]

◆ The Human Eye and the Colourful World

Q35. medium exam-ready **[4]**

Read the following and answer the questions that follow:

Dr. Sharma, an ophthalmologist, examines three patients in one morning. Patient A, aged 14, complains that she cannot read the whiteboard at school from the back rows. Patient B, aged 45, says he has to hold his newspaper at arm's length to read it comfortably. Patient C, aged 65, tells the doctor that she struggles to see both nearby and distant objects clearly and has been prescribed special glasses with two different lens types.

(i) Identify the vision defect each patient is suffering from. [1]
(ii) For Patient A, state the position of the image formed on the eye relative to the retina and the type of corrective lens prescribed. [1]
(iii) For Patient B, explain why the light from a nearby object is not focused on the retina. What type of lens corrects this? [2]

◆ The Human Eye and the Colourful World

Q36. deep exam-ready **[4]**

Read the following and answer the questions that follow:

Priya and her friends are on a stargazing trip on a clear night. Priya notices that stars near the horizon seem to twinkle more vigorously than those directly overhead. Her friend Arun points out that a bright object he identified as the planet Jupiter does not twinkle at all. Later that evening, they notice the full Moon also does not twinkle.

(i) Why do stars twinkle? Name the phenomenon responsible. [1]
(ii) Why do planets like Jupiter not twinkle even though they are also observed through the earth's atmosphere? [1]
(iii) Priya wonders why stars near the horizon twinkle more than those directly overhead. Provide a scientific explanation. [2]

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