Year 2024

Multiple Choice Questions [1Marks]

1) The lens system of human eye forms an image on a light sensitive screen, which is called as :**[(31/1/1); (31/1/2); (31/1/3)]**
(a) Cornea (b) Ciliary muscles (c) Optic nerves (d) Retina

2) In bifocal lenses used for the correction of presbyopia : **[(31/1/3)]**
(a) the upper portion is of convex lens for the near vision and lower part is of concave lens for the distant vision.
(b) the upper portion is of convex lens for the distant vision and lower part is of concave lens for the near vision.
(c) the upper portion is of concave lens is for the near vision and lower part is of convex lens for the distant vision.
(d) the upper portion is of concave lens for the distant vision and lower part is of convex lens for the near vision.

3) Consider the following statements in the context of human eye: **[(31/2/1); (31/2/2); (31/2/3)]**
(a) The diameter of the eye ball is about 2.3 cm.
(b) Iris is a dark muscular diaphragm that controls the size of the pupil.
(c) Most of the refraction for the light rays entering the eye occurs at the crystalline lens.
(d) While focusing on the objects at different distances the distance between the crystalline lens and the retina is adjusted by ciliary muscles.
The correct statements are —
(a) a and b (b) a, b and c (c) b, c and d (d) a, c and d

4) The Phenomena of light involved in the formation of a rainbow in the sky are **[(31/3/1); (31/3/2)]**
(a) Refraction, dispersion and reflection
(b) Refraction, dispersion and total internal reflection
(c) Dispersion, scattering and reflection
(d) Dispersion, refraction and internal reflection

5) When a beam of white light passes through a region having very fine dust particles, the colour of light mainly scattered in that region is : **[(31/4/1); (31/4/2); (31/4/3)]**
(a) Red (b) Orange (c) Blue (d) Yellow

6) The phenomena of light involved in the formation of rainbow are : **[(31/5/1); (31/5/2); (31/5/3)]**
(a) Refraction, reflection and dispersion
(b) Refraction, dispersion and internal reflection
(c) Reflection, dispersion and internal reflection
(d) Refraction, dispersion, scattering and total internal reflection

Assertion and Reasoning [1 Mark]

These consist of two statements —Assertion(A) and Reason(R). Answer these questions selecting the appropriate option given below:
(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.

1) Assertion (A): The rainbow is a natural spectrum of sunlight in the sky.
Reason (R): Rainbow is formed in the sky when the sun is overhead and water droplets are also present in air. **[(31/1/1); (31/1/2); (31/1/3)]**

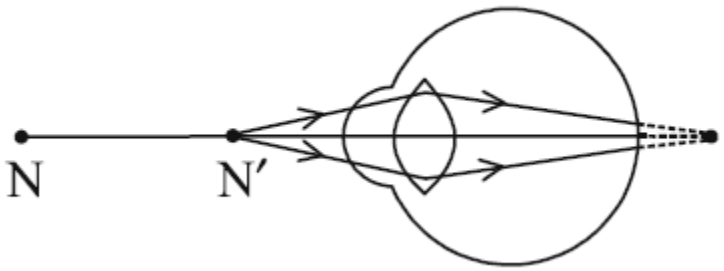
2) Assertion (A): Myopic eye cannot see distant objects distinctly.
Reason (R): For the correction of myopia converging lenses of appropriate power are prescribed by eye-surgeons. **[(31/2/1); (31/2/2)]**
3) Assertion (A) : The colour of clear sky appears blue.
Reason (R) : Light of blue colour has longer wavelength as compared to the light of red colour so it is scattered more in the upper atmosphere. **[(31/2/3)]**
4) Assertion (A) : Red light signals are used to stop the vehicles on the road.
Reason (R) : Red coloured light is scattered the most so as to be visible from a large distance. **[(31/3/1); (31/3/2); (31/3/3)]**

Answer Type Questions [2 Marks]

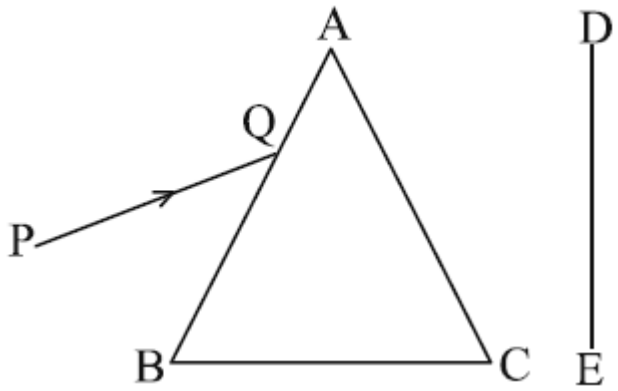
1) A person suffering from an eye defect uses lenses of power —1 D. Name the defect of vision and list its two causes. State the nature(converging/diverging) of the corrective lens.**[(31/2/3)]**
2) What is presbyopia ? Name the type of lenses used for the correction of this defect. State the nature (converging/diverging) of the upper part of such lenses.**[(31/2/3)]**
3) When do we say that a particular person is suffering from hypermetropia ? List two causes of this defect. Name the type of lens used to correct this defect. **[(31/3/1); (31/3/2); (31/3/3)]**
4) A person suffering from presbyopia needs bifocal lens. If he needs two lens of power – 4·0 dioptre and + 2·0 dioptre, which one of these two lenses is for the correction of distant vision and what is its focal length ? **[(31/4/1)]**
5) Name the phenomenon of light responsible for Tyndall effect. Write an event where this phenomenon can be observed. **[(31/4/2)]**
6) What would have been the colour of the sky, if the Earth had no atmosphere ? Give reason to justify your answer. **[(31/4/3)]**
7) Define power of a lens. Find power of a lens whose focal length is 50 cm. **[(31/5/2)]**

Short Answer Type Questions [3 Marks]

1) Study the diagram given below and answer the questions that follow :**[(31/1/1); (31/1/3)]**

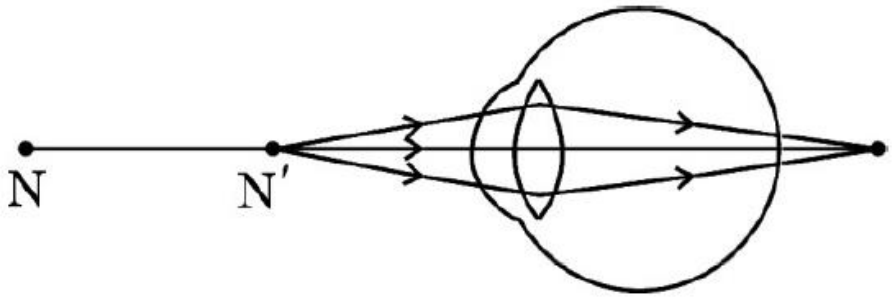


(i)Name the defect of vision represented in the diagram. Give reason for your answer.
(ii) List two causes of this defect.
(iii) With the help of a diagram show how this defect of vision is corrected.
2) A narrow beam, PQ of white light is passing through a glass prism ABC as shown in the diagram.**[(31/1/2)]**



Draw a ray diagram to show the emergent beam as it falls on the screen DE. Also write the phenomenon involved and its cause. Using the second law of refraction state which colour of light must have the highest value of refractive index amongst seven visible colours of light. Justify your answer.

3) Define the term power of accommodation of human eye. Write the name of the part of eye which plays a major role in the process of accommodation and explain what happens when human eye focuses (i) nearby objects and (ii) distant objects. **[(31/2/1); (31/2/3)]**
4) Draw a ray diagram to show the formation of a rainbow in the sky. On this diagram mark A — where dispersion of light occurs, B —where internal reflection of light occurs and C — where refraction of light occurs. List two necessary conditions to observe a rainbow.**[(31/2/1); (31/2/3)]**
5) Name and explain the phenomenon of light due to which the path of a beam of light becomes visible when it enters a smoke filled room through a small hole. Also state the dependence of colour of the light we receive on the size of the particle of the medium through which the beam of light passes. **[(31/3/1); (31/3/2); (31/3/3)]**
6) Define the term power of accommodation of human eye. What happens to the image distance in the eye when we increase the distance of an object from the eye ? Name and explain the role of the part of human eye responsible for it in this case. **[(31/4/1); (31/4/2); (31/4/3)]**
7) Study the diagram given below and answer the questions that follow :



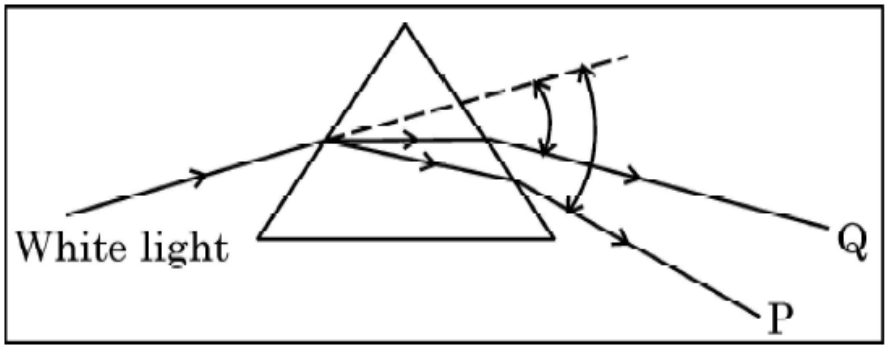
(i) Name the defect of vision depicted in this diagram stating the part of the eye responsible for this condition.
(ii) List two causes of this defect.
(iii) Name the type of lens used to correct this defect and state its role in this case. **[(31/5/1); (31/5/2); (31/5/3)]**

8) What is dispersion of white light ? State its cause. Draw a diagram to show dispersion of a beam of white light by a glass prism. **[(31/5/1); (31/5/2); (31/5/3)]**

Year 2023

Multiple Choice Questions [1Marks]

1) In the following diagram showing dispersion of white light by a glass prism, the colours 'P' and 'Q' respectively are — **[(31/6/1); (31/6/3)]**



(a) Red and Violet (b) Violet and Red(c) Red and Blue (d) Orange and Green

2) In human eye the part which allows light to enter into the eye is **[(31/6/1); (31/6/2)]**
(a) Retina (b) Pupil (c) Eye lens (d) Cornea

3) The phenomena of light involved in the formation of rainbow are **[(31/6/2)]**
(a) Refraction, dispersion and scattering.
(b) Refraction, reflection and dispersion.
(c) Refraction, dispersion and internal reflection.
(d) Reflection, dispersion and total internal reflection.

4) The change in the focal length of an eye lens in human beings is caused by the action of **[(31/6/3)]**
(a) optic nerves (b) ciliary muscles (c) retina (d) cornea

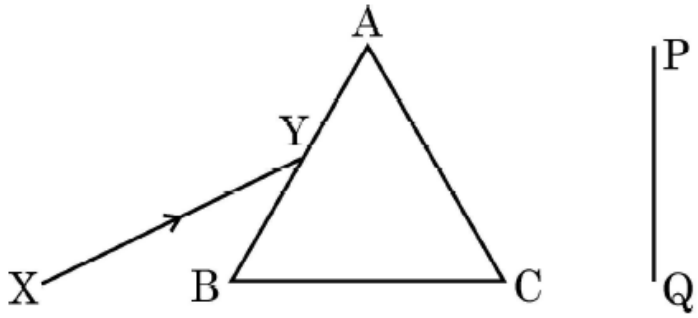
Assertion and Reasoning [1 Mark]

These consist of two statements —Assertion(A) and Reason(R). Answer these questions selecting the appropriate option given below:
(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.

1) Assertion (A): A person suffering from myopia cannot see the distant objects clearly.
Reason(R): A converging lens is used for the correction of myopic eye as it can form real as well as virtual images of the objects placed in front of it. **[(31/2/1); (31/1/3)]**

Very Short Answer Type Questions [2 Marks]

1) A narrow beam XY of white light is passing through a glass prism ABC as shown in the diagram:



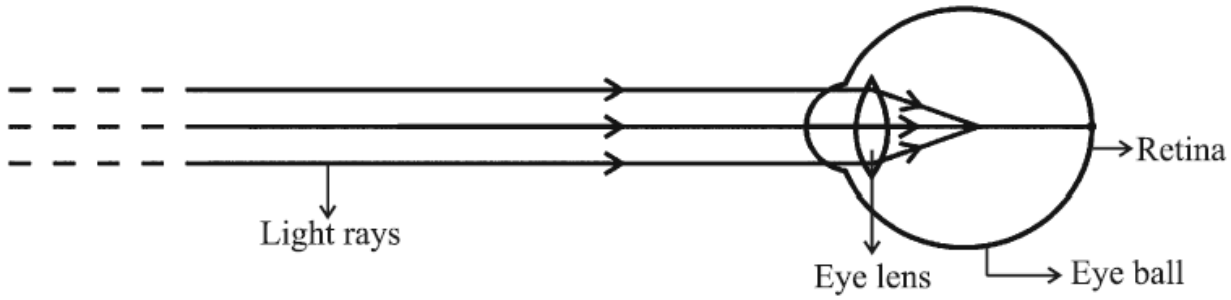
Trace it on your answer sheet and show the path of the emergent beam as observed on the screen PQ.
Name the phenomenon observed and state its cause.**[(31/1/1); (31/1/2); (31/1/3)]**

2) It is observed that the power of an eye to see near by objects as well as far off objects diminishes with age. **[(31/1/1); (31/1/2); (31/1/3)]**
   i. Give reason for the above statement.
   ii. Name the defect that is likely to arise in the eyes in such a condition.
   iii. Draw a labeled ray diagram to show the type of corrective lens used for restoring the vision of such an eye.

3) When and where does a rainbow appear in the sky? Draw a labeled ray diagram to show its formation. **[(31/2/1); (31/2/2); (31/2/3)]**

4) What is scattering of light? Why does the clear sky appear blue? **[(31/2/1); (31/2/2); (31/2/3)]**

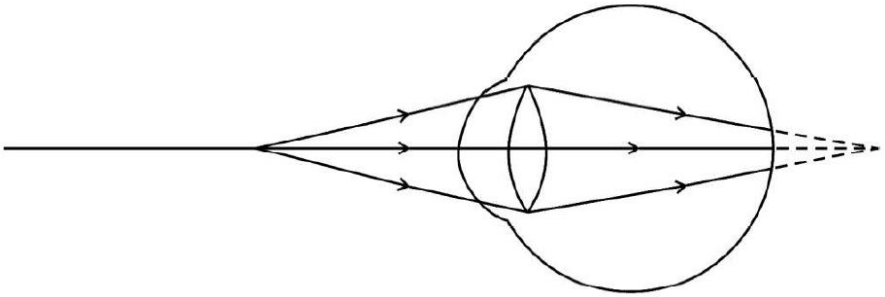
5) Observe the following diagram and answer the questions followingit : **[(31/4/1); (31/4/2); (31/4/3)]**



(i) Identify the defect of vision shown.
(ii) List its two causes.
(iii) Name the type of lens used for the correction of this defect.

6) The colour of clear sky from the earth appears blue but from the space it appears black. Why? **[(31/4/1); (31/4/2); (31/4/3)]**

7) Observe the following diagram showing an image formation in an eye :**[(31/5/1); (31/5/2); (31/5/3)]**



(a) Identify the defect of vision shown in the figure.
(b) List its two causes and suggest a suitable corrective lens to overcome this defect.

Short Answer Type Questions [3 Marks]

1) Give the reason for the following **[(31/1/1)]**
   (a) Danger signals installed at airports and at the top of tall buildings are of red colour.
   (b) The sky appears dark to the passengers flying at very high altitudes.
   (c) The path of a beam of light passing through a colloidal solution is visible.
2) A person is suffering from an eye defect in which the far point of the eye is nearer than infinity. Identify the defect. List two main causes of this defect.
   Draw a ray diagram to show how this defect is corrected by using a suitable lens.**[(31/1/2)]**
3) A person cannot see distinctly the object placed beyond 5m from his eyes. Name the defect of vision the person is suffering from. Draw a ray diagram to illustrate this defect. List its two possible causes. Name the lens used for the correction of this defect.**[(31/1/3)]**
4) Define the term dispersion of white light. State the colour which bends (i) the most, (ii) the least while passing through a glass prism. Draw a diagram to show the dispersion of white light. **[(31/4/3)]**
5) What is a rainbow ? Draw a labelled diagram to show its formation.**[(31/4/3)]**
6) (a) State one important function of the following parts of the human eye :**[(31/5/1)]**
   (i) Retina
   (ii) Pupil
   (b) State the role of ciliary muscles in focussing objects at varying distances from the eye.
7) State reasons for Myopia. With the help of ray diagrams, show the **[(31/6/1); (31/6/2)]**
   (a) image formation by a myopic eye, and
   (b) correction of myopia using an appropriate lens.
8) A person is unable to see clearly a poster fixed on a distant wall. He however sees it clearly when standing at a distance of about 2 m from the wall.
   (a) Draw ray diagram to show the formation of image by his eye lens when he is far away from the wall.
   (b) List two possible reasons of this defect of vision.
   (c) Draw ray diagram to show the correction of this defect using appropriate lens.

Year 2020

Multiple Choice Questions [1 Mark]

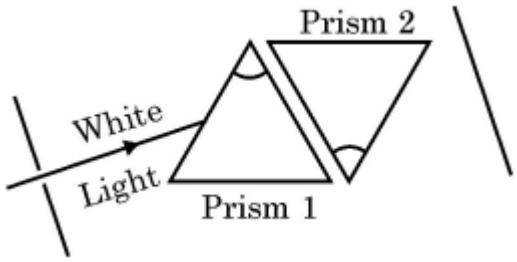
1) Consider the following reasons for the reddish appearance of the sun at the sunrise or the sunset:
A. Light from the sun near the horizon passes through thinner layers of air.
B. Light from the sun covers larger distance of the earth's atmosphere before reaching our eyes.
C. Near the horizon, most 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 **[(31/2/1); (31/2/2); (31/2/3)]**
2) Person suffering from cataract has
(a) elongated eyeball
(b) excessive curvature of eye lens
(c) weakened ciliary muscles
(d) opaque eye lens **[(31/2/1); (31/2/2); (31/2/3)]**
3) 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. **[(31/3/1); (31/3/2); (31/3/3)]**
4) The image distance from the eye lens in the normal eye when we increase the distance of an object from the eye
(a) increases.
(b) decreases.
(c) remains unchanged.
(d) depends on the size of the eyeball **[(31/5/1); (31/5/2); (31/5/3)]**

Short Answer Type Questions [3 Marks]

1) Why is Tyndall effect shown by colloidal particles? State four instances of observing the Tyndall effect. **[(31/1/1); (31/1/2); (31/1/3)]**
2) Differentiate between a glass slab and a glass prism. What happens when an arrow beam of (i) a monochromatic light, and (ii) white light passes through (a) glass slab and (b) glass prism? **[(31/1/1); (31/1/2); (31/1/3)]**
3) 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. **[(31/1/1); (31/1/2); (31/1/3)]**
4) The near point of the eye of a person is 50 cm. Find the nature and power of the corrective lens required by the person to enable him see clearly the objects placed at 25 cm from the eye. **[(31/1/3)]**
5) (a) List two causes of hypermetropia.
(b) Draw ray diagrams showing (i) a hypermetropic eye and (ii) its correction using suitable optical device. **[(31/2/1); (31/2/2)]**
6) (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 wavers. State the basic cause of this observation.

(c) Complete the path of white light when it passes through two identical prisms placed as shown



[(31/2/1); (31/2/2)]

7) List three common refractive defects of vision. Suggest the ways of correcting these defects. **[(31/2/3)]**

8) (a) How is a rainbow formed?
(b) Why do stars twinkle?
(c) Why do the sky appear dark instead of blue to an astronaut? **[(31/2/3)]**

9) (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? **[(31/3/1); (31/3/2); (31/3/3)]**

10) (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 + 3D for correcting his near vision and –3D for correcting his distant vision. Calculate the focal lengths of the lenses required to correct these defects.**[(31/3/1); (31/3/2); (31/3/3)]**

11) 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. **[(31/4/1); (31/4/2)]**

12) 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.**[(31/4/1); (31/4/2); (31/4/3)]**

13) Which defect of the eye is known as far-sightedness? When does this defect arise? State two reasons. How is this defect corrected? **[(31/4/3)]**

14) A student uses spectacles of focal length – 2·5 m.
(a) Name the defect of vision he is suffering from.
(b) Which lens is used for the correction of this defect?
(c) List two main causes of developing this defect.
(d) Compute the power of this lens. **[(31/5/1); (31/5/2); (31/5/3)]**

15) Give reasons:
(a) Red colour is selected for danger signals.
(b) The sky appears dark in space.
(c) The time difference between actual sunset and apparent sunset is about 2 minutes. **[(31/5/1); (31/5/2); (31/5/3)]**

Long Answer Type Questions [5 Marks]

1) (a) A person suffering from myopia (near-sightedness) was advised to wear corrective lens of power – 2·5 D. A spherical lens of same focal length was taken in the laboratory. At what distance should a student place an object from this lens so that it forms an image at a distance of 10 cm from the lens?
(b) Draw a ray diagram to show the position and nature of the image formed in the above case. **[(31/5/1); (31/5/2)]**

Year 2019

Very Short Answer Type Questions [2 Marks]

1) Define the term power of accommodation. Write the modification in the curvature of the eye lens which enables us to see the near by objects clearly?**[(31/1/1)]**
2) Write the structure of eye lens and state the role of ciliary muscles in the human eye. **[(31/1/2)]**
3) What happens to the image distance in the normal human eye when we decrease the distance of an object, say 10 m to 1 m? Justify your answer. **[(31/1/3)]**
4) What is atmospheric refraction ? List two phenomena which can be explained on the basis of atmospheric refraction. **[(31/2/3)]**
5) Why is the colour of the clear sky blue? **[(31/3/1)]**
6) A glass prism is able to produce a spectrum when white light passes through it but a rectangular block of same transparent glass does not produce any spectrum. Why? **[(31/3/2)]**
7) List two causes of presbyopia. Draw labelled diagram of a lens used for the correction of this defect of vision. **[(31/3/3)]**

Short Answer Type Questions [3 Marks]

1) Trace the sequence of events which occur when a bright light is focused on your eyes. **[(31/1/1); (31/1/3)]**
2) What is a rainbow? Draw a labelled diagram to show the formation of a rainbow.**[(31/1/1) ; (31/1/2) ; (31/1/3)]**
3) What happens to a beam of white light when it gets refracted through a glass prism? Which colour deviates the most and the least after refraction through a prism? What is likely to happen if a second identical prism is placed in an inverted position with respect to the first prism? Justify your answer. **[(31/2/3)]**
4) A student needs spectacles of power – 0·5 D for the correction of his vision.
(i) Name the defect in vision the student is suffering from.
(ii) Find the nature and focal length of the corrective lens.
(iii) List two causes of this defect. **[(31/2/3)]**
5) What is atmospheric refraction? Explain with the help of a labelled diagram that the position of a star as seen by us is not its true position. **[(31/3/1) ; (31/3/2) ; (31/3/3)]]**
6) When do we consider a student sitting in the class to be myopic? List two causes of this defect. Explain using a ray diagram how this defect of eye can be corrected. **[(31/3/1) ; (31/3/2) ; (31/3/3)]**
7) What is the cause of dispersion of white light through a glass prism? 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 faces of the prisms. **[(31/4/1) ; (31/4/2) ; (31/4/3)]**

8) What is scattering of light? Use this phenomenon to explain why
(i) the Sun appears reddish at sun-rise, and (ii) the clear sky appears blue. **[(31/4/1) ; (31/4/2) ; (31/4/3)]**

Long Answer Type Questions [5 Marks]

1) When do we consider a person to be myopic or hypermetropic? List two causes of hypermetropia. Explain using ray diagrams how the defect associated with hypermetropic eye can be corrected.**[(31/2/1)]**
2) (a) What is scattering of light? Explain how the colour of the scattered light depends on the size of the scattering particles.
(b) Explain the reddish appearance of the Sun at sunrise or sunset. Why does it not appear red at noon? **[(31/2/2)]**
3) A person is unable to see objects distinctly placed within 50 cm from his eyes.
(a) Name the defect of vision the person is suffering from and list its two possible causes.
(b) Draw a ray diagram to show the defect in the above case.
(c) Mention the type of lens used by him for the correction of the defect and calculate its power. Assume that the near point for the normal eye is 25 cm.
(d) Draw a labelled diagram for the correction of the defect in the above case.**[(31/4/1); (31/4/2)]**

Year 2018

Very Short Answer Type Questions [1 Mark]

1) Name the phenomenon responsible for the twinkling of stars in the sky. **[For Blind Student]**
2) Why does the sky appear dark instead of blue to an astronaut? **[For Blind Student]**

Short Answer Type Questions [3 Marks]

1) A person needs a lenses of power +2.0 D for the correction of his vision.
(a) Name the defect of vision the person is suffering from. Write two causes of this defect.
(b) What is the nature and focal length of the corrective lenses? **[For Blind Student]**

Long Answer Type Questions [5 Marks]

1) (a) 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.
(b) Why do stars twinkle ? Explain. **[All India]**
2) (a) Write the function of each of the following parts of human eye :
(i) Cornea (ii) Iris (iii) Crystalline lens (iv) Ciliary muscles
(b) 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. **[All India]**

Year 2017

Short Answer Type Questions [3 Mark]

1) What is ‘‘dispersion of white light’’? Draw a labelled diagram to illustrate the recombination of the spectrum of white light. Why is it essential that the two prisms used for the purpose should be identical and placed in an inverted position with respect to each other? **[All India]**

2) State the cause of dispersion of white light by a glass prism. How did Newton, using two identical glass prisms, show that white light is made of seven colours? Draw a ray diagram to show the path of a narrow beam of white light, through a combination of two identical prisms arranged together in inverted position with respect to each other, when it is allowed to fall obliquely on one of the faces of the first prism of the combination. **[All India]**
3) What is 'dispersion of white light'? State its cause. Draw a ray diagram to show the dispersion of white light by a glass prism. **[All India]**
4) Due to gradual weakening of ciliary muscles and diminishing flexibility of the eye lens a certain defect of vision arises. Write the name of this defect. Name the type of lens required by such persons to improve the vision. Explain the structure and function of such a lens. **[Delhi]**
5) With the help of a diagram, explain how atmospheric refraction is responsible for the advance sunrise and delayed sunset. How much time difference does it cause on the duration of day on the Earth? **[Foreign]**
6) What is scattering of light ? Use this phenomenon to explain why the clear sky appears blue and the sun appears reddish at sunrise. **[Foreign]**
7) Using the phenomenon of scattering of light, explain why there is a difference in the colour of the sun as it appears during sunrise and at noon. **[Foreign]**

Long Answer Type Questions [5 Mark]

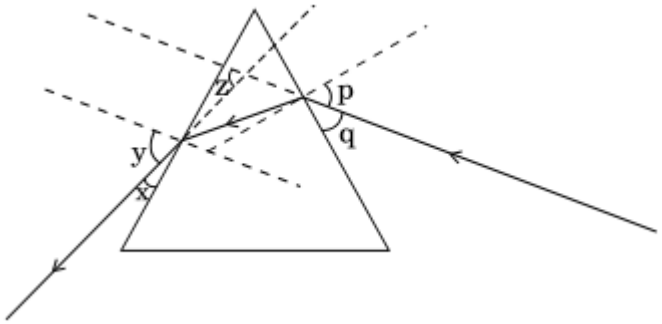
1) (a) A student suffering from myopia is not able to see distinctly the objects placed beyond 5 m. List two possible reasons due to which this defect of vision may have arisen. With the help of ray diagrams, explain
   (i) why the student is unable to see distinctly the objects placed beyond 5 m from 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 **[All India]**
2) (a) Draw a ray diagram to explain the term angle of deviation.
   (b) Why do the component colours of incident white light split into a spectrum while passing through a glass prism, explain.
   (c) Draw a labelled ray diagram to show the formation of a rainbow. **[Delhi]**
3) (a) Write the functions of each of the following parts of the human eye :
   (i) Cornea
   (ii) Iris
   (iii) Crystalline (Eye) lens
   (iv) Ciliary muscles
   (v) Retina

   (b) A person is unable to see distinctly the objects closer than 1 m. Name the defect of vision he is suffering from. Draw ray diagrams to illustrate the cause of the defect and its correction by suitable lens. **[Foreign]**

Practical Skill Based Questions

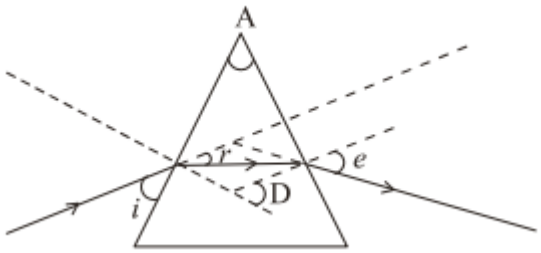
1) Study the following ray diagram :



In this diagram, the angle of incidence, the angle of emergence and the angle of deviation respectively have been represented by

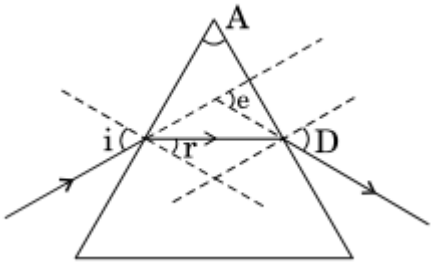
(A) y, p, z
(B) x, q, z
(C) p, y, z
(D) p, z, y

2) In the following diagram the correctly marked angles are :



(a) ∠ A and ∠ e
(b) ∠i, ∠ A and ∠ D
(c) ∠ A, ∠ r and ∠ e
(d) ∠ A, ∠ r and ∠ D

3) In the following diagram, the correctly marked angles are



(A) All
(B) Only ∠i and ∠ A
(C) ∠i, ∠ r and ∠ A
(D) ∠i, ∠ A and ∠ D

Year 2016

Short Answer Type Questions [3 Mark]

1) 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. **[All India]**
2) 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. **[Delhi]**
3) 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. **[Delhi]**
4) 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. **[Delhi]**
5) What is meant by scattering of light? List four phenomena occurring in nature which are explained on the basis of scattering of light. **[For Blind Candidate]**
6) Explain in brief the reason for each of the following :
   (a) Advanced sun-rise
   (b) Delayed sun-set
   (c) Twinkling of stars **[Foreign]**
7) What is meant by advance sunrise and delayed sunset ? Draw a labelled diagram to explain these phenomena.
8) 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. **[Foreign]**

Long Answer Type Questions [5 Mark]

1) 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. **[All India]**
2) (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 programme. **[Delhi]**

3) State the function of each of the following parts of the human eye :

(i) Cornea (ii) Iris

(iii) Pupil (iv) Retina

A person is able to see objects distinctly only when they are lying between 60 cm and 10 m from his eyes. Name the defect of vision he is suffering from. State the type of lenses that may be used to increase the range of vision of the person from 25 cm to infinity. **[For Blind Candidate]**

4) (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]**

5) Explain in brief the reason for each of the following :

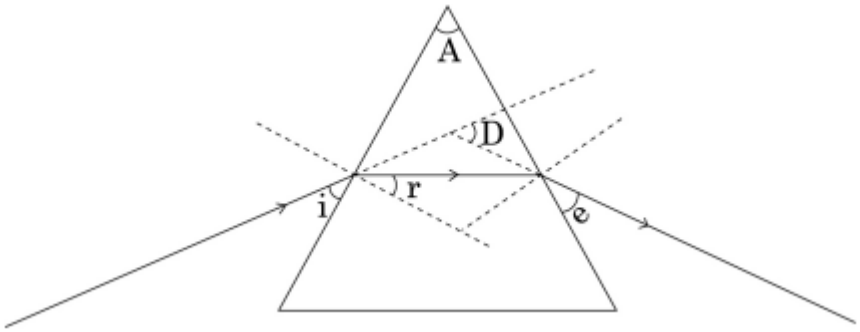
(i) The sun appears reddish during sun-rise.

(ii) At noon the sun appears white.

(iii) To an astronaut the sky appears dark instead of blue. **[Foreign]**

Practical Skill Based Questions [1 Marks]

1) In the following ray diagram the correctly marked angle are :



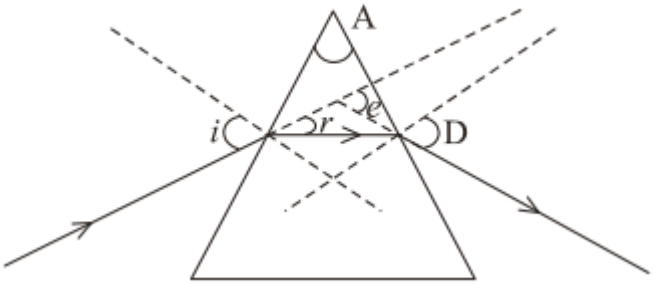
(a) ∠i and ∠e

(b) ∠A and ∠D

(c)∠i, ∠e and ∠D

(d)∠r, ∠A and ∠D

1) Study the following figure in which a student has marked the angle of incidence (∠i), angle of refraction (∠r), angle of emergence (∠e), angle of prism (∠A) and the angle of deviation (∠D). The correctly marked angles are:



(a) ∠A and ∠i
(b) ∠A, ∠i and ∠r
(c) ∠A, ∠i, ∠e and ∠D
(d) ∠A, ∠i, ∠r and ∠D

2) While doing the experiment to trace the path of a ray of light through a glass prism, students were advised by the subject teacher to first draw the outer boundary of the prism on the drawing sheet. This helps the students to :
(a) find out the size of the prism
(b) find out the angle of incidence
(c) find out the angle of deviation
(d) readjust the prism to the same position in case it gets displaced during the experiment.

3) In an experiment to trace the path of a ray of light through a triangular glass prism, a student would observe that the emergent ray
(a) is parallel to the incident ray.
(b) is along the same direction of incident ray.
(c) gets deviated and bends towards the thinner part of the prism.
(d) gets deviated and bends towards the thicker part (base) of the prism.

Year 2015

Very Short Answer Type Questions [2 Marks]

1) Draw a labelled diagram to explain the formation of a rainbow in the sky. **[Foreign]**
2) Why do stars appear to twinkle ? Explain. **[Foreign]**
3) Explain why the planets do not twinkle. **[Foreign]**

Short Answer Type Questions [3 Marks]

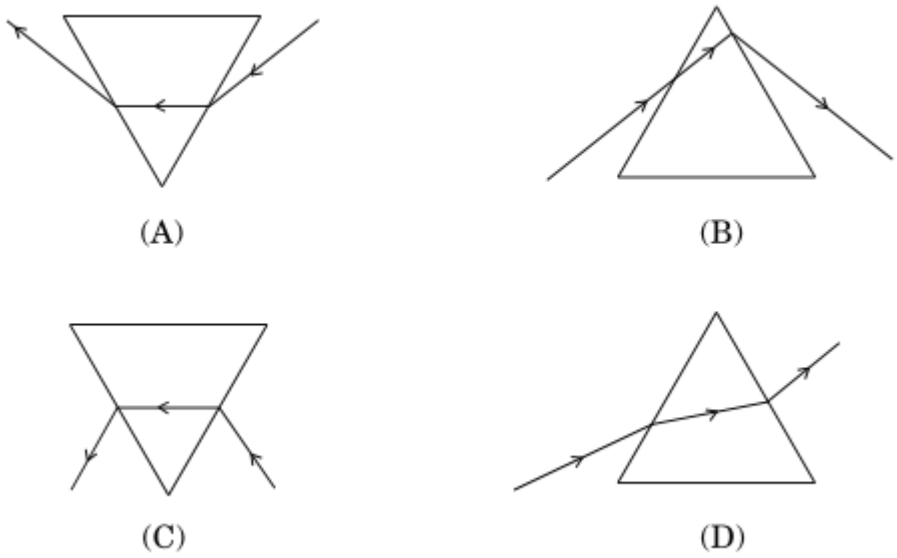
1) What is meant by scattering of light ? Use this phenomenon to explain why the clear sky appears blue or the sun appears reddish at sunrise. **[All India]**
2) What is meant by advance sunrise and delayed sunset ? Draw a labelled diagram to explain these phenomena. **[Foreign]**
3) Explain giving reason 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]**
4) With the help of a labelled diagram, explain why the sun appears reddish at the sun-rise and the sun-set. **[Delhi]**

Long Answer Type Questions [5 Marks]

1) Write the importance of ciliary muscles in the human eye. Name the defect of vision that arises due to 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 ? **[All India]**
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. **[Foreign]**
3) 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]**

Practical Skill Based Questions [1 Marks]

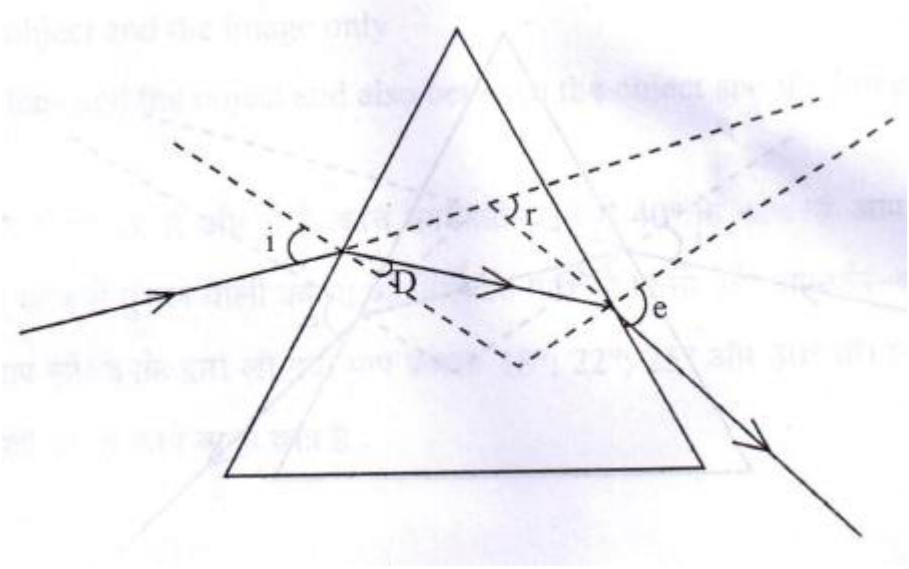
1) A student traces the path of a ray of light through a triangular glass prism for different values of angle of incidence. On analysing the ray diagrams, which one of the following conclusions is he likely to draw ?
   (A) The emergent ray is parallel to the incident ray.
   (B) The emergent ray bends at an angle to the direction of the incident ray.
   (C) The emergent ray and the refracted ray are at right angles to each other.
   (D) The emergent ray is perpendicular to the incident ray.
2) In which of the following four diagrams is the correct path of a ray of light passing through a glass prism shown ?



(A) (B)

(C) (D)

3) After tracing the path of a ray of light through a glass prism astudent marked the angle of incidence (∠i), angle of refraction (∠r)angle of emergence (∠e) and the angle of deviation (∠D) as shownin the diagram. The correctly marked angles are :

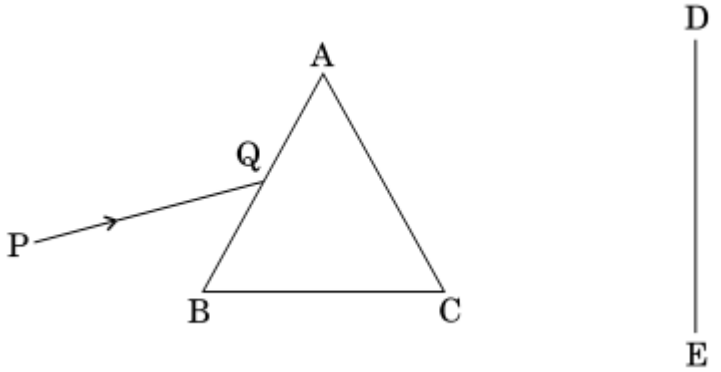


(A) ∠i and ∠r
(B) ∠i and ∠e
(C) ∠i, ∠e and ∠D
(D) ∠i, ∠r and ∠e

Year 2014

Short Answer Type Questions [3 Marks]

1) 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.
(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. **[All India]**

2) 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]**
3) 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]**
4) Draw a labelled ray diagram to show the formation of rainbow in the sky giving brief explanation of the phenomena involved at each stage. List two conditions necessary to observe a rainbow. **[Foreign]**
5) 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. **[Delhi]**
6) Explain with the help of a labelled diagram, the cause of twinkling of stars. **[Delhi]**

Long Answer Type Questions [5 Marks]

1) (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.
(c) 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? **[All India]**
2) 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 of (i) defective eye and (ii) corrected eye. **[Foreign]**
3) (a) List three common refractive defects of vision. Suggest the way of correcting these defects.
(b) 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? **[Delhi]**

Year 2013

Short Answer Type Questions [3 Marks]

1) State the difference in colours of the sun observed during sunrise/sunsetand noon. Give explanation for each. **[Delhi]**

Long Answer Type Questions [5 Marks]

1) (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. **[Delhi]**
2) (b) We see advertisements for eye donation on television or in news papers. Write the importance of such advertisements. **[Delhi]**

Year 2012

Very Short Answer Type Questions [1 Marks]

1) State one function of iris in human eye. **[All India]**
2) 'What will be the colour of the sky when it is observed from a place in theabsence of any atmosphere ? **[Delhi]**
3) State one function of the crystalline lens in the human eye. **[Foreign]**

Very Short Answer Type Questions [2 Marks]

1) Draw a labelled ray diagram to illustrate the dispersion of a narrow beam of white light when it passes through a glass prism. **[All India]**
2) A star appears slightly higher (above) than its actual position in the sky. Illustrate it with the help of a labelled diagram. **[All India]**
3) 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 ray diagram to illustrate it. **[Delhi]**
4) A star sometimes appears brighter and some other times fainter. What is this effect called ? State the reason for this effect. **[Delhi]**
5) Draw a ray diagram to show the formation of a rainbow and mark the point where (i) dispersion, (ii) internal reflection occurs. **[Foreign]**
6) "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]**

Short Answer Type Questions [3 Marks]

1) 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. **[All India]**
2) 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]**
3) 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 2m. 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]**

Year 2011

Very Short Answer Type Questions [1 Mark]

1) Give an example of a phenomenon where Tyndall effect can be observed. **[All India]**
2) What is Tyndall effect ? **[Delhi]**
3) Why is the colour of clear sky blue ? **[Foreign]**

Very Short Answer Type Questions [2 Marks]

1) 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 **[All India]**
2) Explain with the help of a diagram, how we are able to observe the sunrise about two minutes before the sun gets above the horizon. **[All India]**
3) What is meant by the dispersion of white light ? Draw a diagram to show dispersion of white light by the glass prism. **[Delhi]**
4) Explain why the planets do not twinkle but the stars twinkle. **[Delhi]**
5) Explain the formation of rainbow in the sky with the help of a diagram. **[Foreign]**
6) Give reasons :
   (i) The extent of deviation of a ray of light on passing through aglass prism depends on its colour.
   (ii) Lights of red colour are used for danger signals. **[Foreign]**

Short Answer Type Questions [3 Marks]

1) What eye defect is myopia? Describe with a neat diagram how this defect of vision can be corrected by using a suitable lens. **[All India]**
2) What eye defect is hypermetropia ? Describe with a ray diagram how this defect of vision can be corrected by using an appropriate lens.**[Delhi]**
3) Name the three common defects of vision. What are their causes ?Name the type of lens used to correct each of them. **[Foreign]**

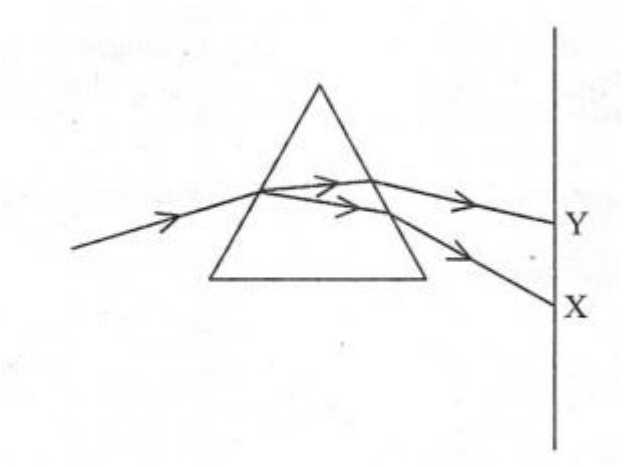
Year 2010

Very Short Answer Type Questions [1 Marks]

1) Name the part of our eyes that helps us to focus near and distant objects in quick succession. **[Delhi]**

Very Short Answer Type Questions [2 Marks]

1) In the figure given below a narrow beam of white light is shown to passthrough a triangular glass prism. After passing through the prism itproduces a spectrum XY on a screen.



(a) State the colour seen at X and Y.
(b) Why do different colours of white light bend through differentangles with respect to the incident beam of light ? **[Delhi]**

2) What is meant by spectrum of white light ? How can we recombine the components of white light after a prism has separated them ? Draw a diagram to illustrate it. **[Foreign]**

Year 2009

Very Short Answer Type Questions [1 Marks]

1) Why does sky look blue on a clear day? **[Delhi]**
2) What will be the observed colour of sky on a planet where there is no atmosphere ? Why ? **[Foreign]**

Short Answer Type Questions [3 Marks]

1) What is hypermetropia ? State the two causes of hypermetropia. With the help of ray diagrams, show :
(i) the eye-defect hypermetropia (ii) correction of hypermetropia by using a lens **[Delhi]**
2) (a) What is Presbyopia ? State the cause of Presbyopia. How is Presbyopia of a person corrected ?
(b) What is meant. by power of accommodation of the eye of a person ? **[Foreign]**

Long Answer Type Questions [5 Marks]

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 the normal eye unable to focus on an object placed within10 cm from the eye ?**[All India]**
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. **[All India]**

Year 2008

Long Answer Type Questions [5 Marks]

1) (a) What is meant by dispersion of white light? Describe the formation of rainbow in the sky with the help of a diagram.
   (b) What is hypermetropia ? Draw ray diagrams to show the image formation of an object by :
   (i) Hypermetropic eye
   (ii) Correction made with a suitable lens for hypermetropic eye.
2) (a) Give reasons for the following :
   (i) Colour of the clear sky is blue.
   (ii) The sun can be seen about two minutes before actual sunrise.
   (iii) We cannot see an object clearly if it is placed very close to the eyes.
   (b) What is Presbyopia? Write two causes of this defect.