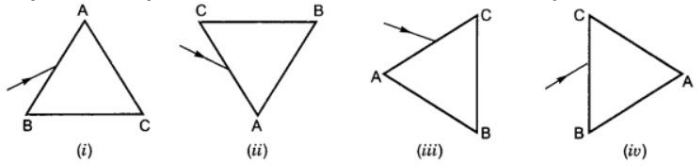
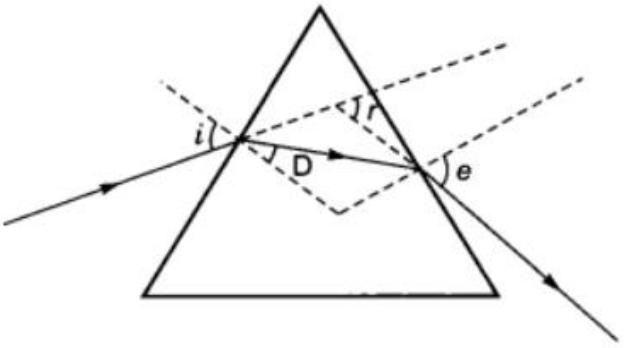
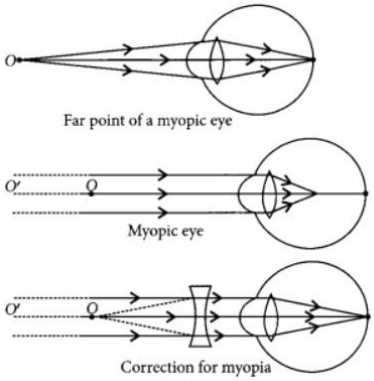
Question Bank
Grade 10
Chapter 11-The Human eye and the colourful world

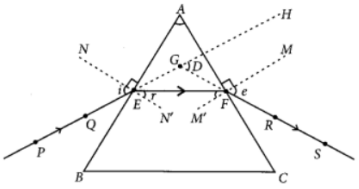
q.no	Questions	answers
1	A person cannot see distinctly objects kept beyond 2 m. This defect can be corrected by using lens of power (a) +0.5 D (b) -0.5 D (c) +0.2 D (d) -0.2 D	(b) -0.5 D
2	A student sitting on the last bench can read the letters written on the blackboard but is not able to read / the letters written in his textbook. Which of the following statements is correct? (a) The near point of his eyes has receded away. (b) The near point of his eyes has come closer to him. (c) The far point of his eyes has come closer to him. (d) The far point of his eyes has receded away.	(a) The near point of his eyes has receded away.
3	A prism ABC (with BC as base) is placed in different orientations. A narrow beam of white light is incident on the prism as shown in the Figures given below. In which of the following cases, after dispersion, the third colour from the top corresponds to the colour of the sky?  (a) (i) (b) (ii) (c) (iii) (d) (iv)	(b) (ii)
4	At noon the sun appears white as (a) light is least scattered. (b) all the colours of the white light are scattered away.	(a) light is least scattered.

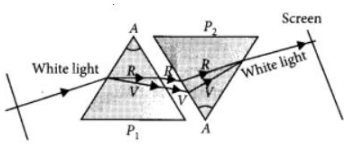
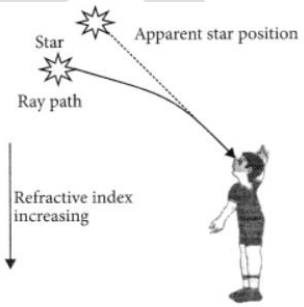
	(c) blue colour is scattered the most. (d) red colour is scattered the most.	
5	Twinkling of stars is due to atmospheric (a) dispersion of light by water droplets (b) refraction of light by different layers of varying refractive indices (c) scattering of light by dust particles (d) internal reflection of light by clouds	(b) refraction of light by different layers of varying refractive indices
6	The clear sky appears blue because (a) blue light gets absorbed in the atmosphere. (b) ultraviolet radiations are absorbed in the atmosphere. (c) violet and blue lights get scattered more than lights of all other colours by the atmosphere. (d) light of all other colours is scattered more than the violet and blue colour lights by the atmosphere.	(c) violet and blue lights get scattered more than lights of all other colours by the atmosphere.
7	The danger signals installed at the top of tall buildings are red in colour. These can be easily seen from a distance because among all other colours, the red light (a) is scattered the most by smoke or fog. (b) is scattered the least by smoke or fog. (c) is absorbed the most by smoke or fog. (d) moves fastest in air.	(b) is scattered the least by smoke or fog.
8	When light rays enter the eye, most of the refraction occurs at the (a) crystalline lens (b) outer surface of the cornea (c) iris (d) pupil	(b) outer surface of the cornea
9	The focal length of the eye lens increases when eye muscles (a) are relaxed and lens becomes thinner (b) contract and lens becomes thicker (c) are relaxed and lens becomes thicker (d) contract and lens becomes thinner	(a) are relaxed and lens becomes thinner
10	A student is observing the diagram showing the path of a ray of light passing through a glass	(a) towards the normal while entering into the

	prism. He would find that for all angles of incidence the ray of light bends: (a) towards the normal while entering into the prism and away from the normal while emerging out of the prism (b) away from the normal while entering into the prism and towards the normal while emerging out of the prism. (c) away from the normal while entering as well as while emerging out of the prism. (d) towards the normal while entering as well as while emerging out of the prism.	prism and away from the normal while emerging out of the prism
11	After tracing the path of a ray of light through a glass prism a student marked the angle of incidence (∠i), angle of refraction (∠r), angle of emergence (∠e) and the angle of deviation (∠D) as shown in 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	(b) ∠i and ∠e
12	The splitting of white light into its component colours is called (a) refraction (b) reflation (c) dispersion (d) tyndall effect	(c) dispersion
13	Define the term power of accommodation. Write	The ability of the eye lens

	the modification in the curvature of the eye lens which enables us to see the nearby objects clearly?	to adjust its focal length is called power of accommodation. The ciliary muscles modifies the curvature to some extent. The change in the curvature of the eye lens can thus change its focal length. When the ciliary muscles contract, the lens becomes thick and its focal length decreases, thus enables us to see nearby objects clearly.
14	What eye defect is myopia? Describe with a neat diagram how this defect of vision can be corrected by using a suitable lens.	Myopia is also known as near-sightedness. A person with myopia can see nearby objects clearly but cannot see distant objects distinctly. Myopia can he corrected by using concave lens of appropriate local length 
15	Name the three common defects of vision. What are their causes? Name the type of lens used to	Three common defects of

	correct each of them.	vision are ● Myopia ● Hypermetropia ● Presbyopia Myopia can be caused due to following reasons. ● Elongation of eyeball. ● Excessive curvature of eye lens. Hypermetropia can be caused due to following reasons. ● Shortening of eyeball. ● Focal length of eye lens becomes too long. Presbyopia is caused due to gradual weakening of ciliary muscles and diminishing flexibility of eye lens due to ageing. Correction of these defects: ● Myopia can be

		corrected by using concave lens of appropriate focal length. ● Hypermetropia can he corrected by using convex lens of appropriate local length. ● Presbyopia can be corrected by using bifocal lens.
16	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.	 i = angle of incidence (a) PE = incident ray (b) FS = emergent ray (c) ∠D = angle of deviation
17	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.	Newton was the first to use a glass prism to obtain the spectrum of a white light. He then placed a second identical prism in an inverted position with respect to the first prism. This allowed all the colours of the white light to pass through the second prism

		combining to form a white light emerging from the other side of the second prism. This made him believe that white light was composed of different colours. 
18	Why do stars appear to twinkle ? Explain.	 Due to atmospheric refraction, position of star visible from sun, is slightly different from its actual position. This apparent position of the star is not stationary, but keeps on changing with change in physical condition on earths atmosphere. Since the stars are very distant, they are approximately point-sized sources of light. As the path of rays of light coming from the star goes on varying slightly, the apparent position of the star fluctuates and the amount of starlight

		entering the eye flickers the star sometimes appears brighter, and at some other time, fainter, which is the twinkling effect.
	Following questions 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.	
19	**Assertion(A) :** White light is dispersed into its seven-colour components by a prism. **Reason (R) :** Different colours of light bend through different angles with respect to the incident ray as they pass through a prism.	(a)
20	Assertion(A) : The phenomenon of scattering of light by the colloidal particles gives rise to Tyndall effect. Reason (R): The colour of the scattered light depends on the size of the scattering particles.	(b)
21	Assertion(A) : A rainbow is sometimes seen in the sky in rainy season only when observer's back is towards the Sun. Reason (R) : Internal reflection in the water	(a)

	droplets cause dispersion and the final rays are in backward direction.	
22	Assertion(A) : Danger signals are made of red colour. Reason (R) : Velocity of red light in air is maximum, so signals are visible even in dark.	(c)
23	Assertion (A): The stars twinkle, while the planets do not. Reason (R) : The stars are much bigger in size than the planets.	(b)
24	Assertion (A) : Blue colour of sky appears due to scattering of blue colour. Reason (R) : Blue light has longer wavelength.	(c)
25	***Read the following and answer any four questions from (i) to (v)*** Atmospheric refraction is the phenomenon of bending of light on passing through earth's atmosphere. As we move above the surface of earth, density of air goes on decreasing. Local conditions like temperature etc. also affect the optical density of earth's atmosphere. On account of atmospheric refraction, stars seen appear higher than they actual are; advanced sunrise; delayed sunset, oval appearance of the sun at sunrise and sunset; stars twinkle, planets do not. **(i) Due to atmospheric refraction, apparent length of the day**	

(a) increases
(b) decreases
(c) remains the same
(d) all of these

Answer: (a) Due to atmospheric refraction, apparent length of the day increases by 4 minutes.

(ii) Apparent position of the star appears raised due to
(a) atmospheric refraction
(b) scattering of light
(c) both (a) and (b)
(d) none of these

Answer: (a) Apparent position of the stars appears raised due to atmospheric refraction.

(iii) The sun appears oval shaped or flattened due to
(a) dispersion
(b) scattering
(c) atmospheric refraction
(d) cannot say

Answer: c

(iv) Twinkling of stars and non-twinkling of planets is accounted for by
(a) scattering of light
(b) dispersion of light
(c) atmospheric refraction
(d) none of these

	Answer: c **(v) In absence of atmosphere, the colour of sky appears** (a) blue (b) black (c) red (d) yellow Answer: (d) Due to no scattering of light.	