Roll No :
Date : 2025-12-24

School : ACHIEVERS
FOUNDATION
Assessment : The Human Eye
and the Colourful World
Subject : Physics
Class : CBSE -X

Time : 00:00

Marks: 53

1   The muscular diaphragm that controls the size of the pupil is   **1**
     (a) cornea (b) ciliary muscles
     (c) iris (d) retina

 Ans : (c) Iris control the size of pupil.

2   Having two eyes facilitates in   **1**
     A : Increasing the field of view
     B : Bringing three dimensional view
     C : Developing the concept of distance/size
     Then the correct option is/are
     (a) A only (b) A and B only
     (c) B only (d) A, B and C

 Ans : (d)

3   The black opening between the aqueous humour and the lens is called   **1**
     (a) retina (b) iris
     (c) cornea (d) pupil

 Ans :
 (d) The black opening between the aqueous humour and the eye lens is
 called pupil.

4   Near and far points of a young person normal eye respectively are: **1**
     (a) 0 and infinity
     (b) 0 and 25 cm
     (c) 25 cm and infinity
     (d) 25 cm and 150 cm.

 Ans : (c) Near point = 25 cm while far point = infinity.

5 The defect of vision in which the person is able to see distant object   **1**
   distinctly but cannot see nearby objects clearly is called
   (a) Long sightedness

(b) Far-sightedness

(c) Hypermetropia

(d) All above

Ans :

(d) Hypermetropia is also called long-sightedness or far-sightedness.

6 The ability of eye lens to adjust its focal length to form a sharp image of   1
the object at varying distances on the retina is called

(a) Power of observation of the eye

(b) Power of adjustment of the eye

(c) Power of accommodation of the eye

(d) Power of enabling of the eye

Ans : (c) It is called power of accommodation of the eye.

7   Myopia and hypermatropia can be corrected by   1

(a) Concave and plano-convex lens

(b) Concave and convex lens

(c) Convex and concave lens

(d) Plano-concave lens for both defects.

Ans :

(b) Myopia is corrected by using of suitable power of concave lens while
hypermetropia is corrected by convex lens.

8   Bi-focal lens are required to correct   1

(a) astigmatism (b) coma

(c) myopia (d) presbyopia

Ans :

(d) Bifocal lens are required to correct the presbiopia. Upper point of
bifocal lens consists of concave lens used for distant vision while lower
point consists of convex lens facilitates near vision.

9 The defective eye of a person has near point 0.5 m and point 3 m. The   1
power far corrective lens required for (i) reading purpose and (ii) seeing
distant objects, respectively are:

(a) 0.5 D and +3D

(b) +2D and $-\dfrac{1}{3}$ D

(b) −2D and $+\dfrac{1}{3}$ D

(d) 0.5 D and − 3.0 D

Ans : (b) For reading purpose

$u = -25$ cm, $v = 0.5$ m $= -50$ cm, $f = ?$ $P = ?$

Using, $\dfrac{1}{f} = \dfrac{1}{v} - \dfrac{1}{u} = \dfrac{1}{-50} - \dfrac{1}{-25} = \dfrac{1}{50}$

$\therefore P = \dfrac{100}{f(cm)} = 100 \times \dfrac{1}{50} = +2$ D

For distant objects

$u = \infty$, $v = -3$ m, $f = ?$ $P = ?$

$\dfrac{1}{f} = \dfrac{1}{v} - \dfrac{1}{u} = \dfrac{1}{-3} - \dfrac{1}{\infty} = -\dfrac{1}{3}$

$\therefore P = \dfrac{1}{f(m)} = -\dfrac{1}{3}$ D

10 The image formed on the retina of the human eye is   1
   (a) virtual and inverted
   (b) real and inverted
   (c) real and erect
   (d) virtual and erect

Ans :

(b) Eye lens is convex in nature. So, image formed by it on the retina is real and inverted.

11 The air layer of atmosphere whose temperature is less then the hot   1
   layer behave as optically
   (a) denser medium
   (b) rarer medium
   (c) inactive medium
   (d) either denser or rarer medium

Ans :

(a) The cold air layer of the atmosphere acts as a optically denser medium than hot air because the molecules are closely packed together.

12 Refraction of light by the earth's atmosphere due to variation in air   1
   density is called
   (a) atmospheirc reflection
   (b) atmospheric dispersion
   (c) atmospheric scattering
   (d) atmospheric refraction

Ans : (d) This phenomena is called atmospheric refraction.

13 The deflection of light by minute particles and molecules of the   1
atmosphere in all direction is called _____ of light.
(a) dispersion
(b) scattering
(c) interference
(d) tyndell effect

Ans :(b) The said phenomenon is called scattering of light.

14 One cannot see through the fog, because   1
(a) refractive index of the fog is very high
(b) light suffers total reflection at droplets
(c) fog absorbs light
(d) light is scattered by the droplets

Ans :
(d) Objects are not visible through the fog because droplets scatter the light rays.

15 A person cannot see distinctly objects kept beyond 2 m. This defect can   1
be corrected by using a lens of power
(a) + 0.5 D (b) − 0.5 D
(c) + 0.2 D (d) − 0.2 D

Ans :
(b) Person cannot see distant objects clearly. So he is suffering from myopia. The defect is corrected by using concave lens of power

$$P = \frac{1}{f} = \frac{1}{-2\,m} = -0.5\,D$$

16 At noon the sun appears white as   1
(a) light is least scattered
(b) all the colours of the white light are scattered away
(c) blue colour is scattered the most
(d) red colour is scattered the most

Ans :
(a) At noon, the sun is at top and the light rays coming from the sun have to travel lens distance hence, all colours get scattered very less even blue and violet.

17 Twinkling of stars is due to atmospheric   1
(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.

Ans :

(b) Twinkling of star is due to atmospheric refraction of starlight caused by the gradual change in refractive index of different air layers at different height, the apparent position of star keeps on changing.

18 The clear sky appears blue because   **1**

(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.

Ans :

(c) Violet and blue colour have shorter wavelength. So, they scattered more than lights of other colour by the molecules present in the atmosphere.

19 The danger signals installed at the top of tall buildings are red in colour.   **1**

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

Ans :

(b) Red colour has longer wavelength so least scattered by smoke or fog.

20 The bluish colour of water in deep sea is due to   **1**

(a) the presence of algae and other plants found in water

(b) reflection of sky in water

(c) scattering of light

(d) absorption of light by the sea

Ans :

(c) The fine water molecules mainly scatter blue light due to its shorter wavelength.

21 When light rays enter the eye, most of the refraction occurs at the   **1**
    (a) crystalline lens
    (b) outer surface of the cornea
    (c) iris
    (d) pupil

Ans :

(b) Most of the refraction for light rays entering the eye occurs at the
outer surface of cornea which acts a primary lens converging in nature.

22 The focal length of the eye lens increases when eye muscles   **1**
    (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

Ans :

(a) Cilliary muscles modify the curvature of eye lens. When eye muscles
are relaxed, eye lens becomes thinner thereby are relaxed, eye lens
becomes thinner thereby increase in the focal length of eye lens.

23 The near point and the far point are determined with regards to the   **1**
    function of which part of the eye?
    (a) Pupil
    (b) Retina
    (c) Eye-ball
    (d) Ciliary muscles

 Ans :(d)

24 Which of the following can be directly affected if the iris does not   **1**
    function properly?
    (a) Identification of colours
    (b) The amount of light entering the eye
    (c) Transmission of visual information to the brain
    (d) Finer adjustments for focussing the objects

 Ans :(b)

25 When the eye is looking at a distant objects, the ciliary muscles are in   **1**
    a
    (a) contract position

(b) relaxed position
(c) neutral position
(d) stretched position

Ans :(b)

26 Which of the following correctly gives the sequence of events that take place when human eye changes its focus from a distant object to an object closer to the eye?   **1**
(a) Ciliary muscles relax → Curvature of eye lens increases → Focal length of eye lens increases
(b) Ciliary muscles contract → Curvature of eye lens decreases → Focal length of eye lens increases
(c) Ciliary muscles relax → Curvature of eye lens decreases → Focal length of eye lens decreases
(d) Ciliary muscles contract → Curvature of eye lens increases → Focal length of eye lens decreases

Ans :(d)

27 Which of these is a reason why a far-sighted person needs a convex lens to correct his vision?   **1**
(a) The image forms in front of his retina.
(b) The image forms behind the retina.
(c) The image forms below the retina.
(d) The image forms on the retina.

Ans :(b)

28 Under which of these can myopia and hypermetropia be classified?   **1**
(a) Breakdown of tissues.
(b) Incorrect bending of light in the eye.
(c) Incorrect reflection of light by surfaces around us.
(d) Incorrect coordination with brain for colour.

Ans :(b)

29 Myopia and hypermetropia can be corrected by   **1**
(a) concave and plano-convex lens
(b) concave and convex lens
(c) convex and concave lens
(d) plano-concave lens for both defects.

Ans :

(b) Myopia is corrected by using of suitable power of concave lens while hypermetropia is corrected by convex lens.

30 Bi-focal lens are required to correct   1
    (a) cataract
    (b) hypermetropia
    (c) myopia
    (d) presbyopia

Ans :

(d) Bifocal lens are required to correct the presbyopia. Upper point of bifocal lens consists of concave lens used for distant vision while lower point consists of convex lens facilitates near vision.

31 The basic cause of refractive error that makes far-away objects look   1
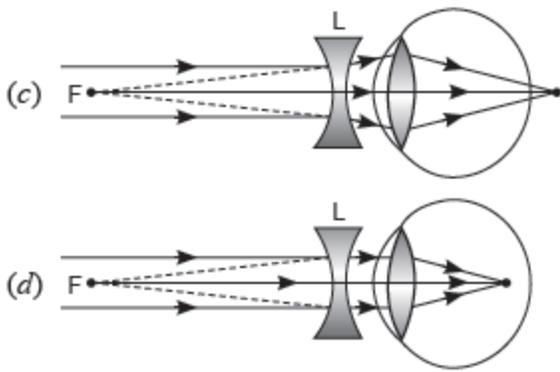   blurry is
    (a) decrease in the focal length of eye-lens.
    (b) increase in the focal length of eye-lens.
    (c) decreasing curvature of eye-lens.
    (d) weakening of ciliary muscles.

Ans :(a)

32 The diagram showing the correctness of refractive error in which   1
    images focus in front of retina is

(c) F

(d) F
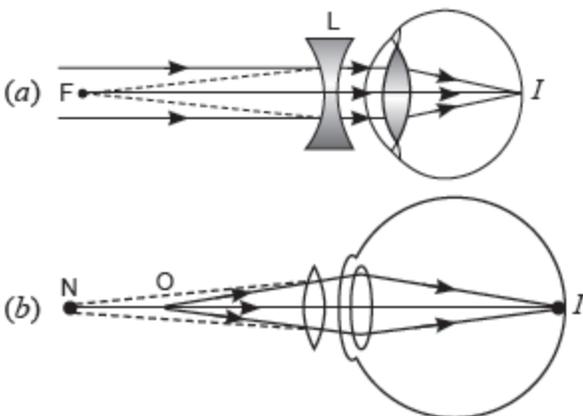
Ans :(a)

33 Corrective lens used to correct the myopic defect of eye forms a virtual image of distant object at

(a) near point of myopic eye

(b) far point of myopic eye

(c) least distance of distinct vision

(d) any where between near point and far point of the eye.

Ans :(b)

34 The defective eye of a person has near point 0.5 m and far point is at 3 m. The power for corrective lens required for (i) reading purpose and (ii) seeing distant objects, respectively are:

(a) 0.5 D and +3D

(b) +2D and $-\dfrac{1}{3}$D

(c) − 2D and $+\dfrac{1}{3}$D

(d) 0.5 D and − 3.0 D

Ans :

(b) For reading purpose u = − 25 cm, v = 0.5 m = − 50 cm, f = ? P = ?

Using, $\dfrac{1}{f} = \dfrac{1}{v} - \dfrac{1}{u} = \dfrac{1}{-50} - \dfrac{1}{-25} = \dfrac{1}{50}$

∴ $P = \dfrac{100}{f(cm)} = 100 \times \dfrac{1}{50} = +2\,D$

For distant objects

$u = \infty, v = -3\,m, f = ?\,P = ?$

$\dfrac{1}{f} = \dfrac{1}{v} - \dfrac{1}{u} = \dfrac{1}{-3} - \dfrac{1}{\infty} = -\dfrac{1}{3}$

∴ $P = \dfrac{1}{f(m)} = -\dfrac{1}{3}D$

35 The defect of vision in which image of nearby objects is formed behind the retina is

(a) short-sightedness

(b) far-sightedness

 (c) presbyopia

 (d) all of these

 Ans :(b)

36 If curvature of eye lens causes decrease in its focal length, then the refractive defect of vision will be **1**

 (a) myopia

 (b) hypermetropia

 (c) presbyopia

 (d) cataract

 Ans :(a)

37 A person's near point is at 45 cm and far point is at 2 m. What kind of corrective lens is BEST suited for his vision defect? **1**

 (a) Convex

 (b) Concave

 (c) Bifocal

 (d) Plano-convex

 Ans :(c)

38 The defect of vision in which the person is able to see distant object distinctly but cannot see nearby objects clearly is called **1**

 (a) Long sightedness

 (b) Far-sightedness

 (c) Hypermetropia

 (d) All of these

 Ans :

 (d) Hypermetropia is also called long-sightedness or far-sightedness.

39 A student traces the path of 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? **1**

 (a) The emergent ray is parallel to incident ray.

 (b) The emergent ray bends at an angle to the direction of incident ray.

 (c) The emergent ray and refracted ray are at right angles to each other.

 (d) The emergent ray is perpendicular to the incident ray.

 Ans :(b)

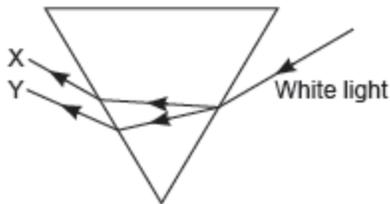40 In the following diagram, the correctly marked angles are **1**
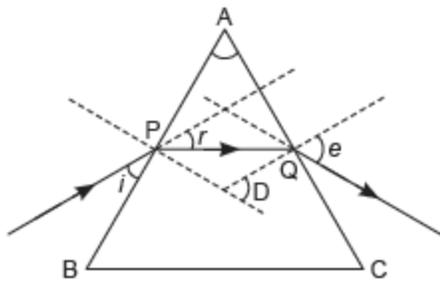
(a) ∠A and ∠e
(b) ∠i, ∠A and ∠D
(c) ∠A, ∠i and ∠e
(d) ∠A, ∠r and ∠D

Ans :a

41 In the diagram given below, X and Y are the end colours of the spectrum of white light. The colour of 'Y' represents the

1

(a) colour of sky as seen from earth during the day.

(b) colour of the sky as seen from the moon.

(c) colour used to paint the danger signals.

(d) colour of sun at the time of noon.

Ans :c

42 **A prism is used to**

1

(a) change the path of light by reflection and refraction both

(b) rotate the image

(c) disperse the light into its components

(d) all of these

Ans :(c)

43 When white light enters a prism, it gets split into its constituent colours. This is due to

1

(a) different refractive index for different wavelength of each colour

(b) each colours has same velocity in the prism.

(c) prism material have high density.

(d) scattering of light.

Ans :

(a) Dispersion takes place because refractive index of the material of prism is different for different wavelength.

44 If a beam of red light and a beam of violet light are incident at the same angle on the inclined surface of a prism from air medium and produce angles of refraction 'r' and 'v' respectively, which of the following is correct?   1

(a) r = v

(b) r > v

(c) r = $\frac{1}{v}$

(d) r < v

Ans :d

45 The phenomenon of dispersion prove that   1

(a) white light passes through a transparent medium.

(b) sunlight is made up of seven colours.

(c) light travels in a straight line path.

(d) different colours travel with the same speed while passing through a glass prism.

Ans :b

46 When a narrow beam of white light is passed through two identical prisms, one placed inverted with respect to the other, the emerging beam will be   1

(a) white beam

(b) blue light

(c) red light

(d) all seven colours

Ans :a

47 When a ray of light passes through a glass prism it suffers two refractions. During these refractions the ray bends: 1

(a) Away from the base in both cases

(b) Towards the base in both cases

(c) Towards the base in first case and away from the base in second case

(d) Away from the base in first case and towards the base in second case

Ans :b

48 In the formation of rainbow, the role of water droplet presents in water fountains is to act as a　　　　**1**
(a) glass slab
(b) convex lens
(c) concave lens
(d) prism

Ans :d

49 When sunlight enters the water droplet suspended in the atmosphere after rainfall, it will get　　　　**1**
(a) refracted only
(b) refracted internally
(c) refracted and dispersed
(d) first refracted and then dispersed while coming out of the water droplet.

Ans :(c)

50　To an astronaut the sky on the moon appear dark because　　　　**1**
(a) there is no light on the moon.
(b) there is no atmosphere on the surface of the moon.
(c) moon is non-luminous object.
(d) the surface of the moon absorbs all the sunlights.

Ans :(b)

51 Rohan lit an incense stick in his room and after an hour observed that when a beam of sunlight entered his room through a small gap in the window, he was able to see the path of the beam. Which of the following is most likely TRUE about the air present in the room?　　　　**1**
(a) It is a pure substance.
(b) It is a compound.
(c) It is a solution.
(d) It is a colloid.

Ans :(d)

52　Which one of the following is the correct reason for twinkling of stars?　　　　**1**
(a) Atmospheric reflection of starlight
(b) Atmospheric refraction of starlight
(c) Scattering of starlight

(d) Dispersion of starlight

Ans :(b)

53 Blue colour of clear sky is due to   **1**
   (a) refraction of light
   (b) absorption of light
   (c) reflection of light
   (d) scattering of light

Ans :(d)