



Grade10 – Physics

Worksheet

Chapter 11

The Human Eye and The Colourful World

Multiple choice Questions:

- 1) **Twinkling of stars is due to**
 - (a) Reflection of light by clouds
 - (b) scattering of light by dust particles
 - (c) dispersion of light by water drops
 - (d) atmospheric refraction of starlight

- 2) **Which colour of light refracts most when passes through a prism-**
 - (A) yellow
 - (B) Red
 - (C) orange
 - (D) indigo

- 3) **When white light passes through a prism, the component colour which Undergoes maximum bending is**
 - (a) red
 - (b) green
 - (c) violet
 - (d) blue

- 4) **The change in focal length of an eye lens is caused by the action of the**

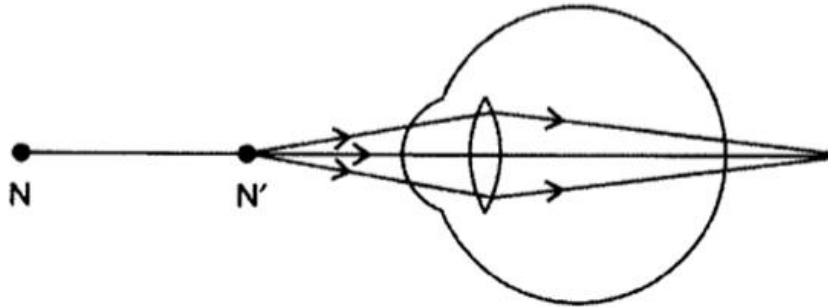
- A) Pupil
 - B) Retina
 - C) Ciliary muscles
 - D) Iris
- 5) When a person is myopic, he/ she can clearly see
- A) Both nearby and far-off objects
 - B) Only nearby objects
 - C) Only far-off objects
 - D) Neither near nor far off objects

Answer the following:

- 1) What is meant by the power of accommodation of the eye ?
- 2) A person with a myopic eye cannot see objects beyond 1.2 m distinctly. What should be the type of the corrective lens used to restore proper vision ?
- 3) A student has difficulty reading the blackboard while sitting in the last row. What could be the defect the child is suffering from ? How can it be corrected?
- 4) What is the far point and near point of the human eye with normal vision ?
- 5) Why do stars twinkle?
- 6) Draw the sketch diagram of the human eye. And explain about the different parts of the eye.
- 7) A 14-year old student is not able to see clearly the questions written on the blackboard placed at a distance of 5 m from him. placed at a distance of 5 m from him. (a) Name the defect of vision he is suffering from. (a) Name the defect of vision he is suffering from. (b) With the help of labelled ray diagrams show how this defect can be corrected. (b) With the help of labelled ray diagrams show how this defect can be corrected. (c) Name the

type of lens used to correct this defect.

8) Study the diagram given below and answer the questions that follow it.



(a) Which defect of vision is represented in this case? Give reason for your answer.

(b) What could be the two causes of this defect?

(c) What could be the two causes of this defect?

(d) With the help of a diagram show how this defect can be corrected by the use of a suitable lens.

9) 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, All white light after a prism has separated them? Draw a diagram to illustrate it.

10) Name the part of our eyes that helps us to focus near and distant objects in quick succession.

11) The far point of a myopic person is 80 cm in front of the eye. What is the nature and power of the lens required to correct the problem?

12) What happens to the pupil of the eye when the light is very bright?

13) Which colour has the largest wavelength?

14) Draw a diagram to show the dispersion of white light by a glass prism.

15) State the role of the eye lenses in the human eye?

Assertion-Reason Questions

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.

1) 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.

2) Assertion (A) : A normal human eye can clearly see all

the objects beyond certain minimum distance. Reason

(R) : The human eye has capacity of adjusting the focal length of eye lens.

3) 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 droplets cause dispersion and the final rays are in backward direction.

4) Assertion (A) : Myopia is the defect of the eye in which only nearer objects are seen by the eye. Reason (R) : The eye ball is elongated.

5) Assertion (A) : Hypermetropia is the defect of the eye in which only farther objects are seen. Reason (R) : Hypermetropia is corrected by using converging lens.

Case-Based questions

1) Case 1

Colourful clothes, colour television and the flashing coloured lights in a disco all help to make life brighter. It was Newton who, in 1666, set us on the road to understanding how colours may arise. He produced them by allowing sunlight (which is white) to fall on a triangular glass prism. The band of colours obtained is a spectrum and this phenomenon is dispersion

- 1) For which colour refractive index of glass is maximum?
a)Red b) Violet c) Yellow d)Green**
- 2) The seven coloured light of a spectrum can be recombined when two prisms are placed in
a) Horizontal position with respect to each other.
b) Adjacent position with respect to each other
c) Inverted position with respect to each other
d) Vertical position with respect to each other**
- 3) When white light enters into a prism, it gets split into its constituent colours. This is due to
a) Different refractive index for different wavelength of each colour
b) Each colour has same velocity in the prism
c) Prism material have high density
d) Scattering of light**
- 4) The angle between incident ray and emergent ray of prism is called
a)Angle of incidence
b) Angle of deviation
c) Angle of emergence
d) Angle of refraction**

2) Case 2

One of nature's most splendid masterpieces is the rainbow. A rainbow is an excellent demonstration of the dispersion of light and one more piece of evidence that visible light is composed of a spectrum of wavelengths, each associated with a distinct colour. To view a rainbow, the sun must be at your back as you look at an approximately 40 degree angle above the ground into a region of the atmosphere with suspended droplets of water or even a light mist. Each individual droplet of water acts as a tiny prism that both disperses the light and reflects it back to your eye.

i) Formation of rainbow involves some natural phenomena which are in the correct order respectively is

- a) refraction, dispersion, internal reflection and refraction
- b) refraction, dispersion, internal reflection
- c) reflection, refraction, dispersion and refraction
- d) dispersion, reflection, refraction and internal reflection

ii) During the formation of a rainbow the position of observer and sun is

- a) Observer behind sun
- b) sun behind the observer
- b) Observer facing sun
- d) at any position

iii) During the formation of rainbow, dispersion of sunlight is done by

- a) tiny air molecules
- b) dust particles of atmosphere
- c) tiny droplets of rain water suspended in air
- d) air and water

iv) The dispersion of light into its components by prism is due to

- a) each component get deviated by the same angle by refraction

b) each component gets deviated by a different angle by refraction

c) reflection of each component light by different angle

d) reflection of each component light by same angle