Worksheet 10.1

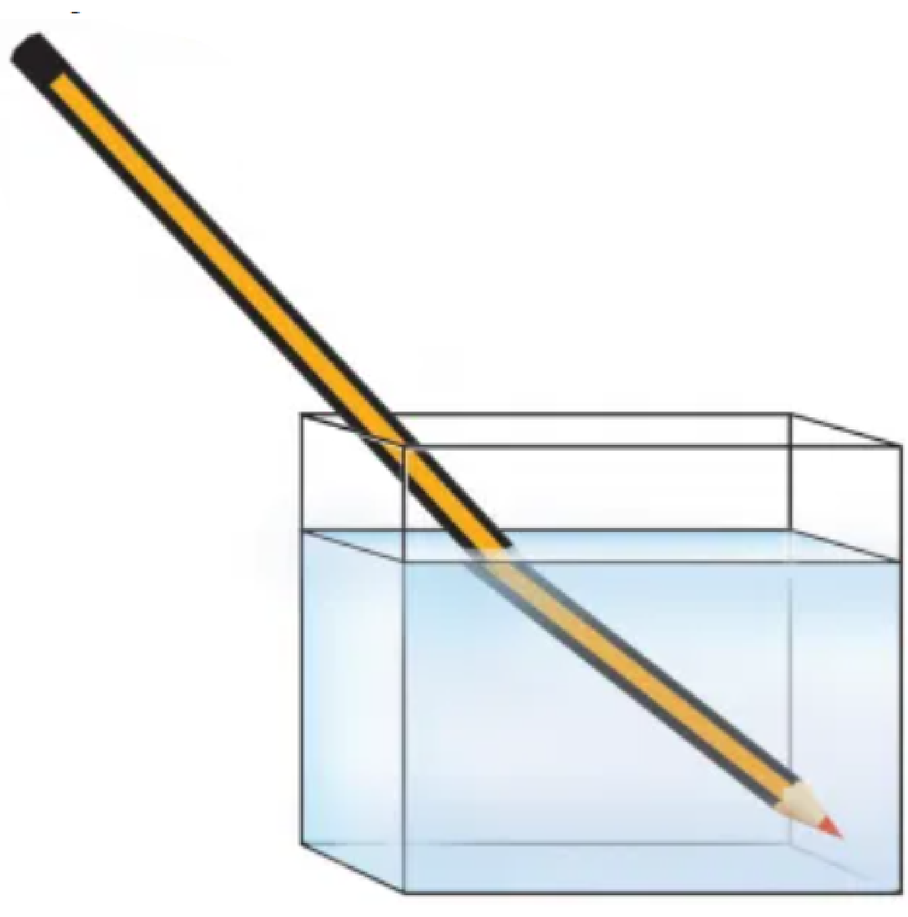
Marks - 25

Case study based questions

10th Science

Light - Reflection and Refraction

Passage - 1 **5 Marks**



The bending of light as it passed from one transparent medium into another is called refraction. Place a pencil in an inclined position in a glass trough and fill three fourth of the trough with water.

Q 1. State true or false: The position of the portion of the pencil under water has changed.

(1) TRUE
(2) FALSE

Q 2. What shall be the reason for the change in the position of the pencil under water?

(1) Due to reflection
(2) Due to refraction

Q 3. Does the ray of light coming after reflection from the pencil undergo a deviation?

(1) YES
(2) NO

Q 4. What is the reason for the ray of light coming after reflection from the pencil undergo deviation?

(1) When light travels from air to air it deviates.
(2) When light travels from water to air it deviates.
(3) When light travels from water to oil it deviates.
(4) NONE OF THESE

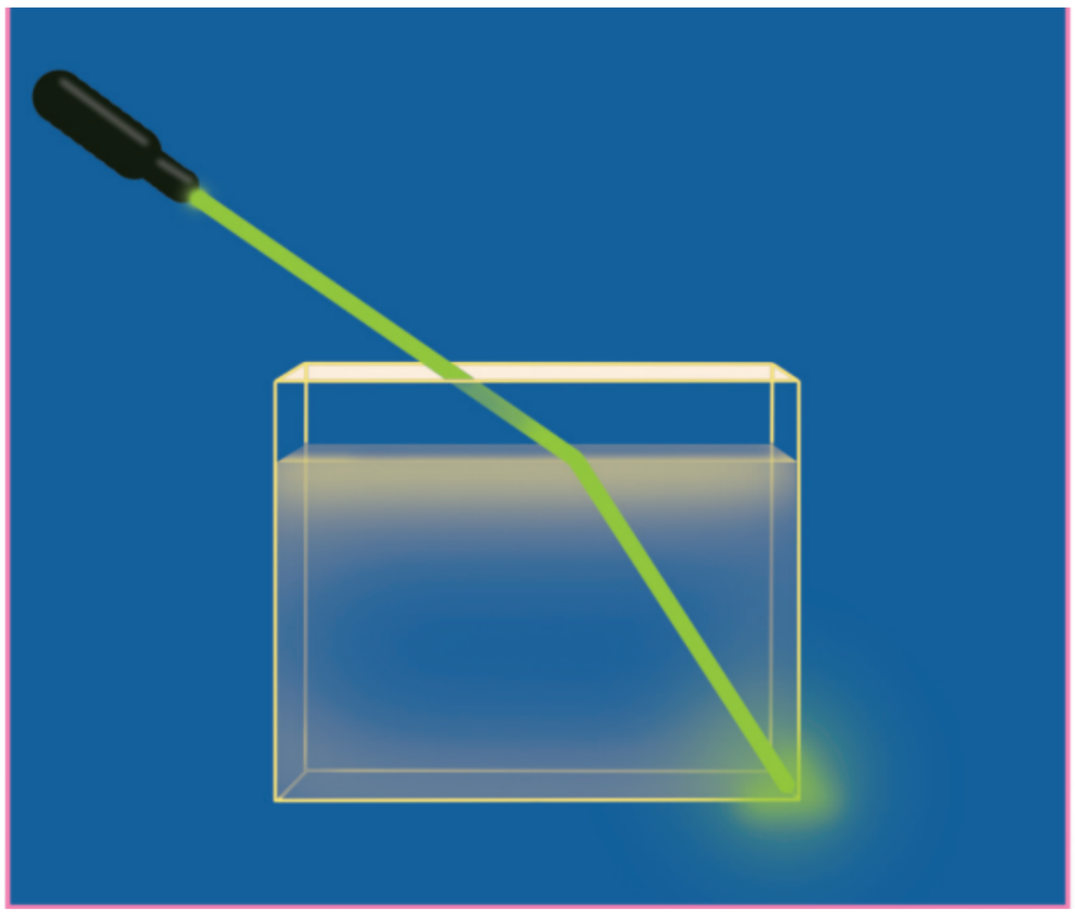
Q 5. Is there any change likely to occur if kerosene is used instead of water?

(1) Pencil appears to be bent less.
(2) Pencil does not bent.
(3) Pencil appears to be bent more.
(4) NONE OF THESE

Passage - 2 **5 Marks**

Worksheet 10.1

Marks - 25



Fill three fourth of a transparent vessel with water as shown in the above figure. Add one or two drops of milk into it. Fill the portion of the vessel above water with smoke. Close the vessel using an OHP glass sheet. Allow the light from a laser torch to pass through water as shown above.

Q 1. State true or false: The light ray below the water undergo deviation at the surface of the water.

(1) TRUE
(2) FALSE

Q 2. What happens to the path of light?

(1) Path of light does not deviate.
(2) Path of light undergoes deviation.

Q 3. Where does the deviation of the ray take place?

(1) At the point on the surface where the OHP sheet is placed.
(2) At the point on the surface where the media get separated.
(3) At the bottom of the vessel.

(4) NONE OF THESE

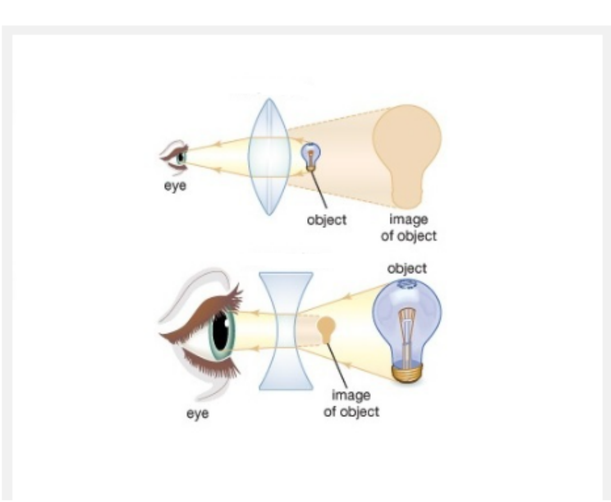
Q 4. Why does the ray of light undergo a deviation here?

(1) The difference in speed of light rays in different media.
(2) The speed of light rays in same media.
(3) Both A and B
(4) NONE OF THESE

Q 5. Does light pass through all the media at the same speed?

(1) YES
(2) NO

Passage - 3 **5 Marks**



Your eyes need to bend light rays so the image can be focused sharply on your retina. The better your retina records the image, the more likely that your brain will interpret the image, and the more likely you will see the image clearly. If a person has vision trouble, glasses or contact lenses are use. They bend the light rays in a way that lets you see more clearly.

Q 1. State true or false: Bifocals use a convex lens to bend light to make things look bigger.

(1) TRUE

(2) FALSE

Q 2. Why does the light rays bend when a glass or contact lens are used for the person who is having vision trouble?

(1) Due to reflection
(2) Due to refraction

Q 3. Light from the sun falling on a convex lens will converge at a point called

(1) Centre of curvature
(2) Focus
(3) Radius of curvature
(4) Optical centre

Q 4. Power of convex lens is _____ and concave lens is _____.

(1) Positive, positive
(2) Positive, negative
(3) Negative, positive
(4) Negative, negative

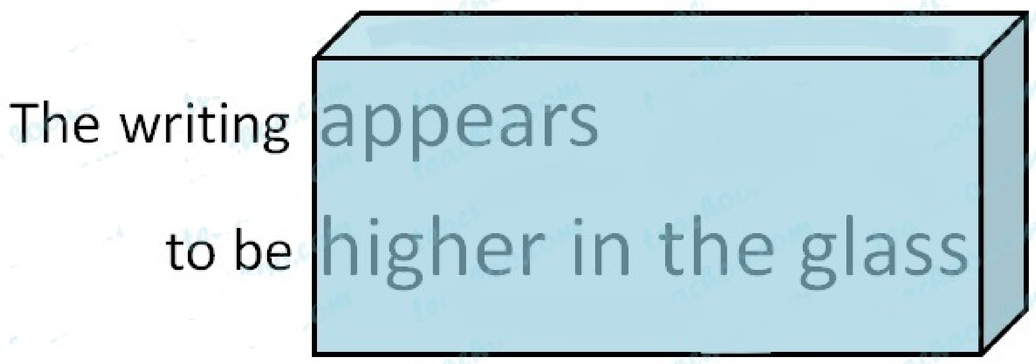
Q 5. The image formed by a convex lens can be

(1) Virtual and magnified
(2) Virtual and diminished
(3) Virtual and of same size
(4) Virtual image is not formed

Passage - 4 **5 Marks**

Worksheet 10.1

Marks - 25



Looking through a glass jar will make an object look smaller and slightly lifted. If a slab of glass is placed over a document or piece of paper, then the words will look closer to the surface.

Q 1. Why the words are closer to the surface of glass?

(1) Because of the different angle the light is bending.
(2) Because of the different angle the light is not bending.
(3) Because of the same angle the light is bending.
(4) NONE OF THESE

Q 2. Observe the figure, what is the reason?

(1) Due to reflection
(2) Due to refraction

Q 3. When a light ray enters a glass slab, it enters from air to glass. Which is the denser medium?

(1) Air
(2) Glass

Q 4. As light rays travel from rarer to denser medium, the ray of light moves

(1) Away from the normal

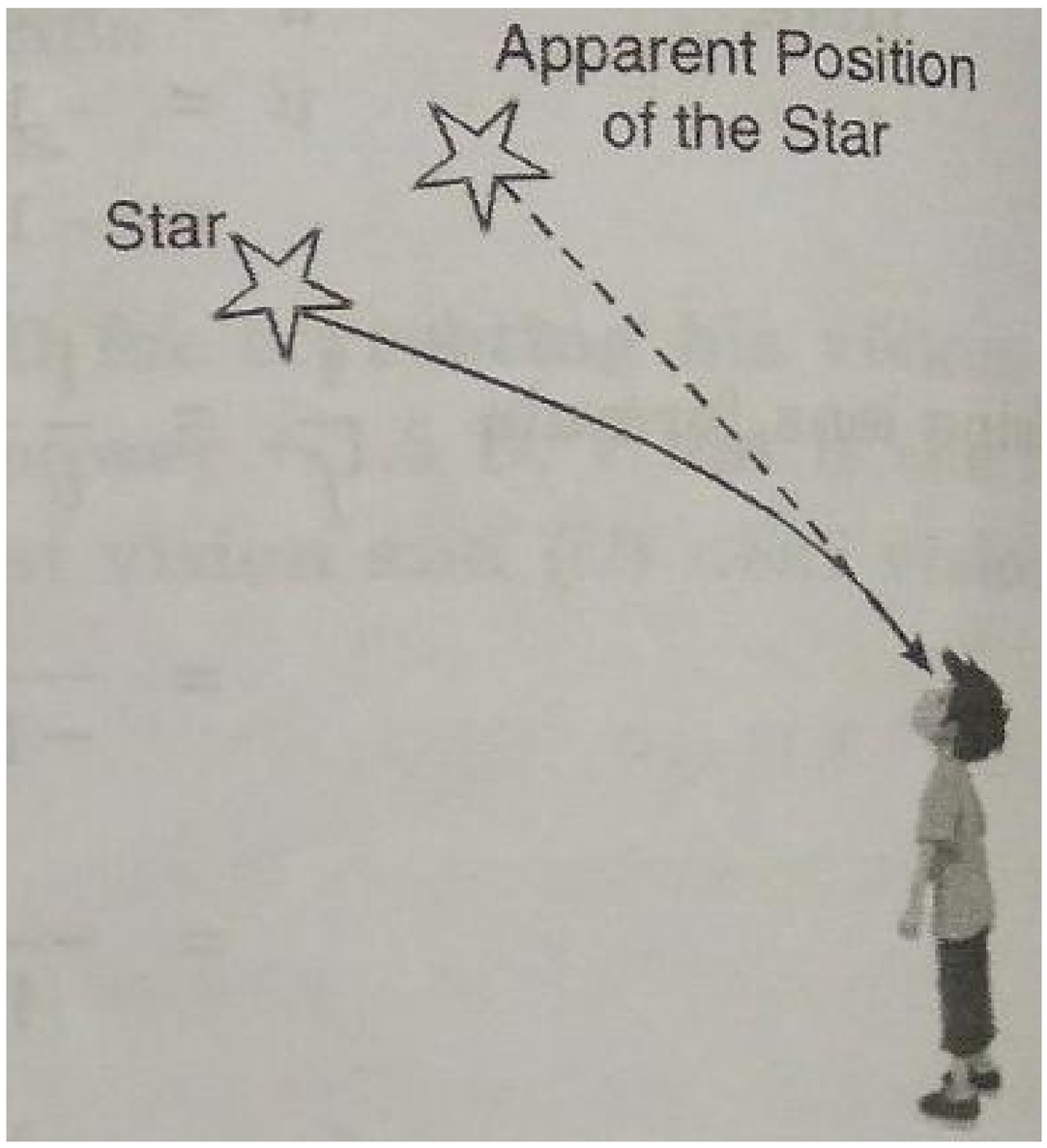
(2) Towards the normal

Q 5. What is the absolute refractive index of glass?

(1) 1.3
(2) 1.4
(3) 1.5
(4) 1.6

Passage - 5

5 Marks



The air in the atmosphere isn't all the same. Some areas are thicker, and some areas are thinner. Therefore when you go out at night and look at the stars, they appear to twinkle.

Q 1. The optical phenomena, twinkling of stars is due to

(1) Atmospheric reflection
(2) Total reflection

(3) Atmospheric refraction
(4) Total refraction

Q 2. The light coming from star when enters the earth atmosphere it experiences increase in density. So the ray of light bend

(1) Away from the normal
(2) Towards the normal

Q 3. The refracting surfaces obeys the _____.

(1) Law of reflection
(2) Law of refraction

Q 4. State true or false: The light of the star which travels through the many layers of the earth's atmosphere is bent many times and in random direction.

(1) TRUE
(2) FALSE

Q 5. The deviation of light ray from its path when it travels from one transparent medium to another transparent medium is called

(1) Reflection
(2) Refraction
(3) Dispersion
(4) Scattering

Worksheet 10.2

Marks - 25

Q 3. Objective lens will create a _____ image of the object being studied.

(1) Real
(2) Virtual

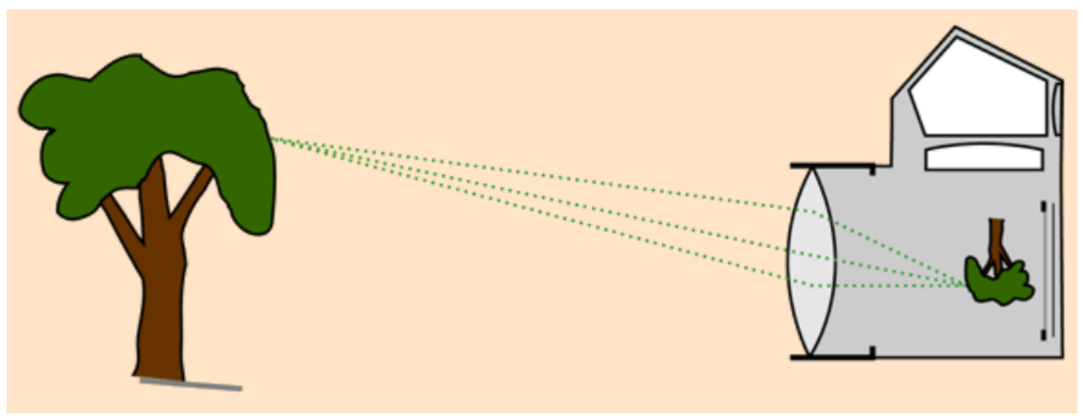
Q 4. Eyepiece lens takes the image created by objective lens and _____ it for your viewing.

(1) Diminishes
(2) Magnifies

Q 5. The lens of a telescope uses a _____ to make things look closer they really are.

(1) Reflection of light
(2) Refraction of light

Passage - 2 **5 Marks**



Ever wondered how camera capture a moment? When you click the shutter, an image is refracted on to a light sensitive surface, giving a snapshot of your birthday property.

Q 1. What kind of lens is used in camera?

(1) Convex lens
(2) Plane lens

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(3) Concave lens
(4) NONE OF THESE

Q 2. The lens in the camera produces a _____ image.

(1) Real and erect
(2) Virtual and erect
(3) Real and inverted
(4) Virtual and inverted

Q 3. The power of concave lens is negative and convex lens is _____.

(1) Positive
(2) Negative

Q 4. The light rays which falling on a convex lens will converge at a point called

(1) Centre of curvature
(2) Radius of curvature
(3) Optical centre
(4) Focus

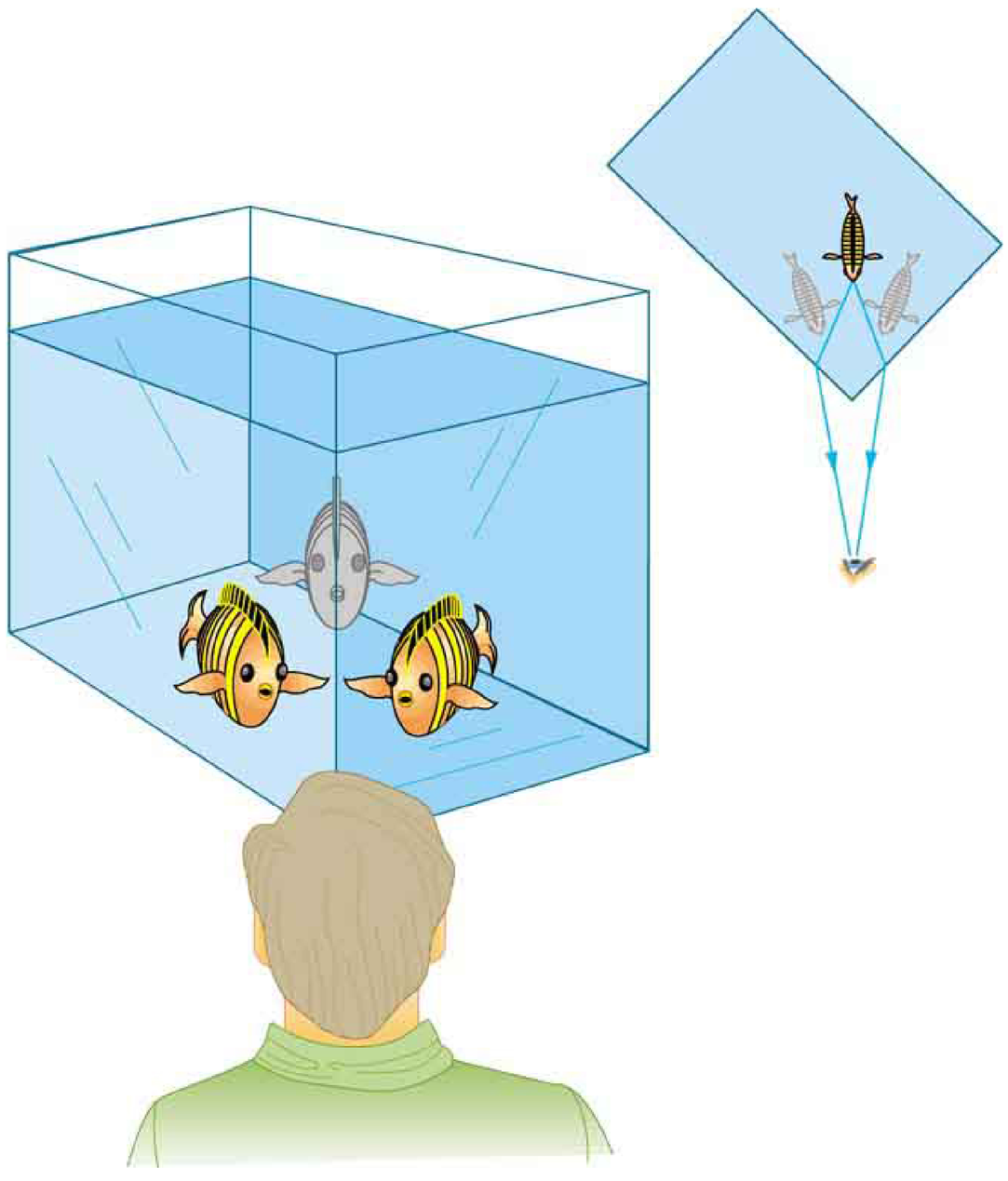
Q 5. A convex lens has a focal length of 10 cm. At what distance from the lens should the object be placed so that it forms a real and inverted image 20 cm away from the lens?

(1) 10 cm
(2) 20 cm
(3) 30 cm
(4) 40 cm

Passage - 3 **5 Marks**

Worksheet 10.2

Marks - 25



If you have an aquarium or fish bowl at home, you might notice the fish look bigger when you look through the side. However, if you put your hand on the opposite side of the bowl, it also looks bigger.

Q 1. Observe the figure, what is the reason?

(1) Due to reflection
(2) Due to refraction

Q 2. State true or false: Light travels faster in air than in glass or water.

(1) TRUE
(2) FALSE

Q 3. Absolute refractive index of any medium is always _____ .

(1) Less than 1
(2) Greater than 1
(3) 1
(4) 0

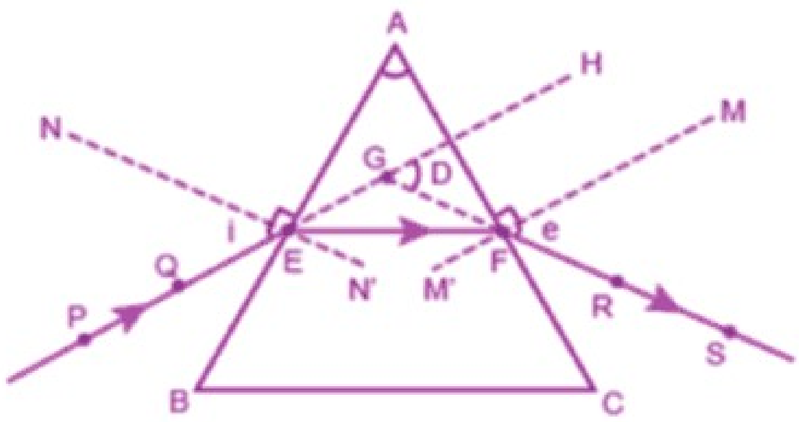
Q 4. The formula to calculate the refractive index is

(1) n = cv
(2) n =
(3) n =
(4) v = nc

Q 5. Glass has a _____ index of refraction than air.

(1) Equal
(2) Greater
(3) Less
(4) Impossible to say

Passage - 4 **5 Marks**



Prism is a transparent optical object with flat, polished surfaces that refract light. At least two of the flat surfaces must have an angle between them.

Worksheet 10.2

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Q 1. When light rays falls on one side of prism, it gets bent _____ .

(1) Towards the normal
(2) Away from normal

Q 2. In refraction of light through a prism, the light ray:

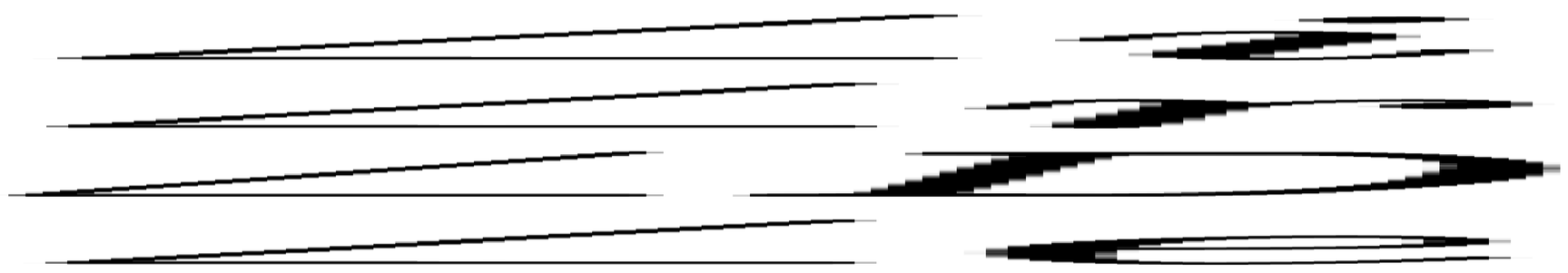
(1) Suffers refraction only at one face of the prism.
(2) Emerges out from the prism in a direction parallel to the incident ray.
(3) Bends at both the surfaces of prism towards its base.
(4) Bends at both the surfaces of prism opposite to its base.

Q 3. Which is the denser medium?

(1) Prism
(2) Air

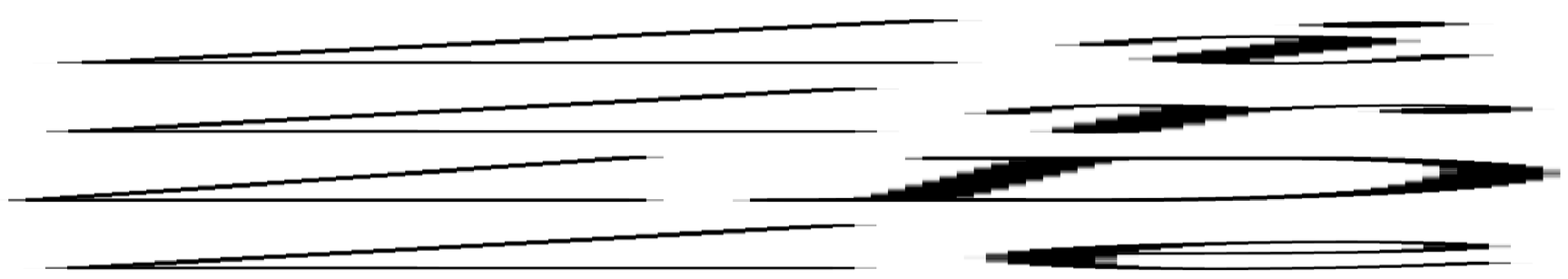
Q 4. In the figure, which is angle of incidence?

(1)
(2)
(3)
(4)



Q 5. In the figure, which is angle of refraction?

(1)
(2)
(3)
(4)

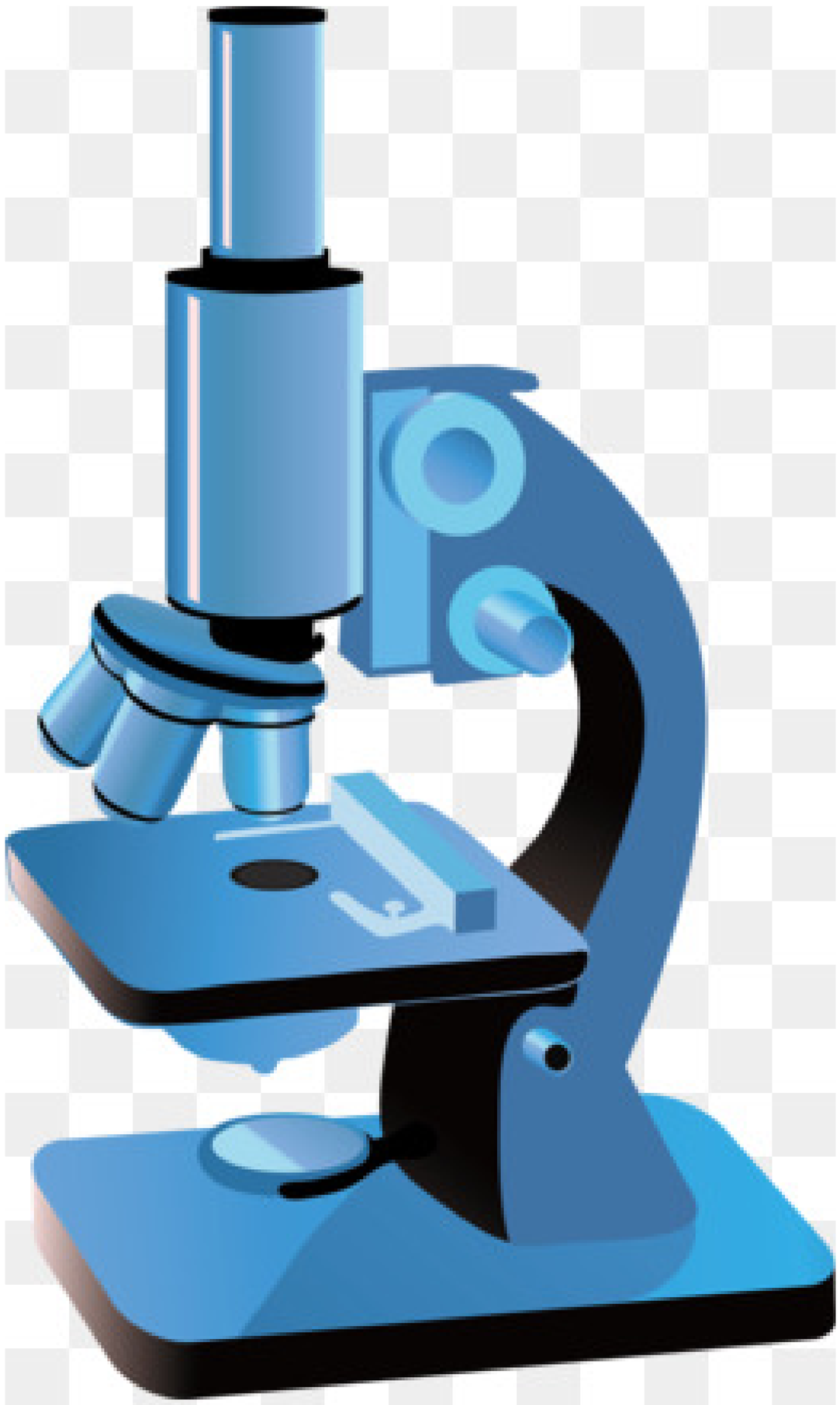


Worksheet 10.2

Marks - 25

Passage - 5

5 Marks



Sunil wants to see the micro organisms present in soil. He knows that he needs a microscope to see those tiny things. A microscope is an instrument used to see a small object to look bigger which helps us in a study of many tiny little species. Well, refraction also plays a huge role in the microscope.

Q 1. What kind of lens is used in microscope?

(1) Concave lens
(2) Convex lens
(3) Bifocal lens

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(4) Plane lens

Q 2. The image formed by a convex lens can be

(1) Vrtual and magnified
(2) Virtual and diminished
(3) Virtual and of same size
(4) Virtual image is not formed

Q 3. Absolute refractive index of any medium is always _____ .

(1) Less than 1
(2) Greater than 1
(3) 1
(4) 0

Q 4. Power of convex lens is _____.

(1) Positive
(2) Negative

Q 5. The refracting surfaces obeys the _____.

(1) Law of reflection
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