HomeWork

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1. State the speed of light in (a) air, (b) water, and (c) glass.

Ans- The speed of light in air is 3×10^8 m s^{-1}.
The speed of light in water is 2.25×10^8 m s^{-1}
The speed of light in glass is 2×10^8 m s^{-1}.

Q. How does the speed of light determine the optical density of a medium?

Ans- A medium is said to be denser if the speed of light in it decreases, while it is said to be rarer if the speed of light in it increases.

Q. Which is optically denser: water of air? Give reason.

Ans- When water travels through water, its speed gets reduced. Hence, it is a optically denser medium. Speed of light in air is more than speed of light in water, which means water is optically denser than air.

4. Out of air and glass, which is optically rarer? Give reasons.

Ans- A medium is rarer when the speed of light increases when light travels through that medium. Speed of light in air is more than speed of light in glass which means air is optically rarer than glass.

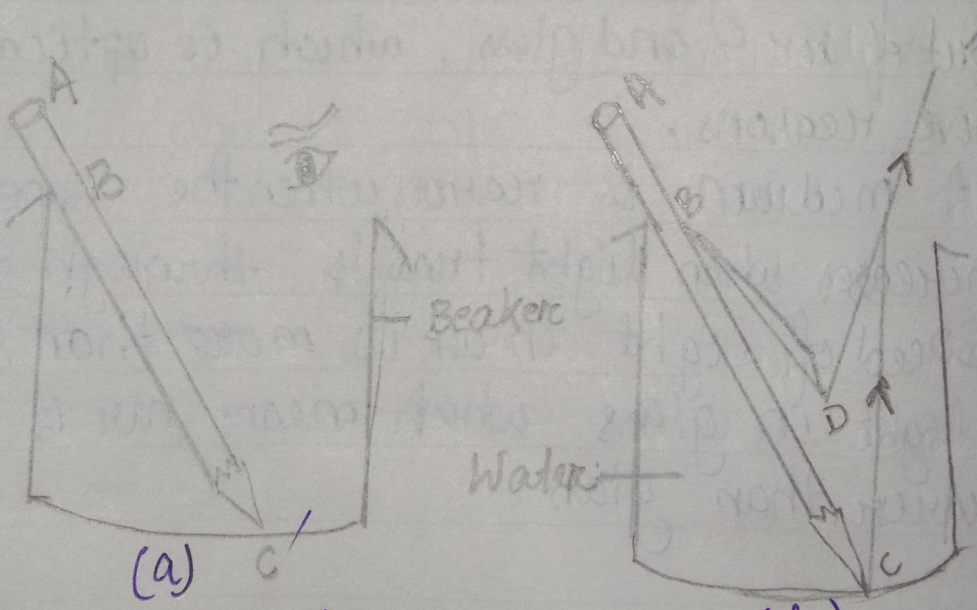
5. what dog you understand by refraction of light?

Ans- The change in direction of path of light when it passes from one optically transparent medium to another, is called refraction of light.

6. Describe an experiment to show that a light ray bends when it passes from one transparent medium into another transparent medium.

Ans-1) Take an empty beaker and a pencil. Place the pencil ABC obliquely in the beaker and look at it from the side. It appears straight as shown in the fig (a).

2) Now pour water in the beaker up to its brim. You will notice that now the pencil appears to be bent as ABD at the surface of water as shown in Fig (b)

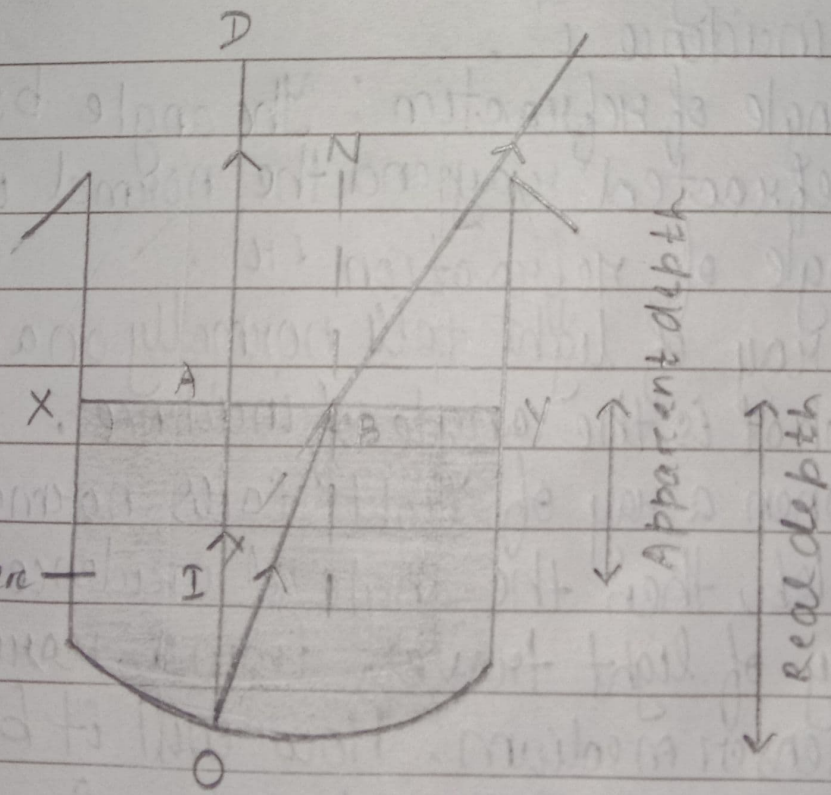


The pencil in water appears to be bent.

Explaination: The ray of light coming from the tip C of the pencil bends at the surface of water as it enters in air and it appears to be coming from the point D. In other words, it is due to refraction of light from water to air that the pencil ABC appears as ABD.

7. Draw a ray diagram to show that the depth of a vessel containing water when seen from above, appears to be less than its real depth.

Ans →



8) Define the following terms:
Incident ray, Refracted ray, Angle of incidence, Angle of refraction.

Ans- * Incident ray: The ray of light falling on the surface separating the two media, is called incident ray.

* Refracted ray: The ray of light travelling in the other medium in the changed direction, is called the refracted ray.

* Angle of incidence: The angle between the incident ray and the normal is called the angle of incidence 'i'.

* Angle of refraction: The angle between the refracted ray and the normal is called the angle of refraction 'r'.

9) A ray of light falls normally on a glass slab. What is the angle of incidence.

Ans- When a ray of light falls normally on a glass slab, then the angle of incidence is zero.

10) A ray of light travels from a rarer medium to a denser medium. How will it bend?

Ans- When a ray of light travels from a rarer to a denser medium it bends towards the normal.