



PHYSICS

BOOKS - HC VERMA PHYSICS (HINGLISH)

SPEED OF LIGHT

Objective 1

1. Light passes through a closed cylindrical tube containing a gas. If the gas is gradually

pumped out, the speed of light inside the tube will

A. increase

B. decrease

C. remain constant

D. first increases then decreases

Answer: A



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2. The speeds of red light and yellow light are exactly same

A. in vacuum but not in air

B. in air but not in vacuum

C. in vacuum as well as in air

D. neither in vacuum nor in air

Answer: A



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3. An illuminated object is placed on the principal axis of a converging lens so that real image is formed on the other side of the lens. If the object is shifted a little,

A. the image will be shifted simultaneously with the object

B. the image will be shifted a little later than the object

C. the image will be shifted as little earlier than the object

D. to image will not shift

Answer: B



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Objective 2

1. The speeds of light is $299,792,458 \text{ m s}^{-1}$

A. with respect to the earth

B. with respect to the sun

C. with respect to as moving on the earth

D. with respect to a spaceship going in
outer space

Answer: A::B::C



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2. Which of the following methods can be used
to measure the speed of light in laboratory?

A. Roemer method

B. Fizeau method

C. Foucault Method

D. Michelson method

Answer: C



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3. Which of the following methods can be used to measure the speed of light in water?

A. Roemer method

B. Fizeau method

C. Foucault method

D. Michelson method

Answer: C



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Exercises

1. In an experiment to measure the speed of light by Fizeau's apparatus, following data are

used :

Distance between the mirrors = 12.0 km,

Number of teeth in the wheel = 180.

Find the minimum angular speed of the wheel for which the image is not seen.



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2. In an experiment with Foucault's apparatus, the various distances used are as follows :

Distance between the rotating and the fixed mirror = 16 m

Distance between the lens and the rotating mirror = 6 m,

Distance between the source and the lens = 2 m. When the mirror is rotated at a speed of 356 revolutions per second, the image shifts by 0.7 mm. Calculate the speed of light from these data.



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3. In a Michelson experiment for measuring speed of light, the distance travelled by light

between two reflections from the rotating mirror is 4.8 km. The rotating mirror has a shape of a regular octagon. At what minimum angular speed of the mirror (other than zero) the image is formed at the position where a nonrotating mirror forms it ?



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