



# PHYSICS

## BOOKS - ICSE

### LIGHT ENERGY

#### Test Yourself True Or False

1. The image formed by a plane mirror is real.

True/False



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2. When a light ray is reflected from a wall, the angle of incidence is not equal to the angle of reflection.



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3. The image of the right hand in a plane mirror looks like that of a left hand.



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4. The image formed by a plane mirror is upright.



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5. The image formed by a plane mirror can be obtained on a screen.



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6. The objects around us are seen due to irregular reflection of light.



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7. The speed of light in vacuum is  $3 \times 10^8 \text{ms}^{-1}$



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8. A rose appears red in light of all the colours.



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**9.** A black paper absorbs light of all the colours and reflects none.



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**10.** The primary colours are red, blue and green.



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## Test Yourself Fill In The Blanks

1. Angle of incidence = .....



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2. The incident ray, the reflected ray and the normal lie.....



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3. The image formed by a plane mirror is at a distance behind the mirror as.....



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4. The image formed by a plane mirror is .....  
and .....



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5. We are able to see the objects around us due to ..... reflection.



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6. A ..... image cannot be obtained on a screen.



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7. One surface of mirror is made opaque by .....it followed by a thin coating of paint of

lead oxide.



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8. A plane mirror.... reflect 100 percent light falling on it.



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9. The colour of an opaque object is the colour of light which it.....



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10. Magenta, cyan and yellow are the.....  
colours.



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[Test Yourself Match The Column](#)

## 1. Match the following:

### Column A

- (a) A light ray passes from air to glass
- (b) A light ray passes from glass to water
- (c) Virtual image
- (d) Red rose
- (e) Red, green and blue

### Column B

- (i) speeds up
- (ii) reflects red light
- (iii) primary colours
- (iv) plane mirror
- (v) slows down



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**Test Yourself Select The Correct**

1. A man standing in front of a plane mirror finds his image to be at a distance of 6 metre

from himself. The distance of man from the mirror is :

A. 6m

B. 3m

C. 2m

D. 12m

**Answer: B**



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2. The angle between the incident ray and the ray reflected from the plane mirror is  $70^\circ$ . The angle of incidence will be:

A.  $70^\circ$

B.  $30^\circ$

C.  $35^\circ$

D.  $90^\circ$

**Answer: C**



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3. The image formed by a plane mirror is

A. virtual and inverted

B. virtual and of same size

C. real and inverted

D. real and of same size

**Answer: B**



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4. The angle of incidence on a plane mirror is  $30^\circ$ . The angle of reflection will be:

A.  $30^\circ$

B.  $60^\circ$

C.  $15^\circ$

D.  $0^\circ$

**Answer: A**



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5. The angle of incidence on a plane mirror is  $30^\circ$ . The angle between the incident ray and the reflected ray is

A.  $30^\circ$

B.  $15^\circ$

C.  $60^\circ$

D.  $90^\circ$

**Answer: C**



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6. The property due to which a light ray striking a surface is returned back into the same medium is called

A. refraction

B. reflex action

C. reflection

D. regression

**Answer: C**



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7. A ray of light after reflection from a mirror is known as

A. reflected ray

B. normal

C. incident ray

D. refracted ray

**Answer: A**



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8. The speed of light is maximum in

A. glass

B. water

C. vacuum

D. wood

**Answer: C**



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9. A red rose is seen in green light. It will appear

A. red

B. blue

C. yellow

D. black

**Answer: D**



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10. The primary colours are

- A. Red, Blue and Yellow
- B. Magenta, Yellow and Cyan
- C. Red, Blue and Cyan
- D. Blue, Green and Red

**Answer: D**



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**Test Yourself Short Long Answer Type Questions**

1. What do you mean by the term reflection of light ?



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2. How is a plane mirror made ?



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3. Explain the following terms :

Incident ray



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4. Explain the Reflected ray



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5. Explain the Angle of incidence



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6. Explain the Angle of reflection





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7. Explain the Normal ray



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8. Draw a diagram showing the reflection of a light ray from a plane mirror. Label on it the incident ray, the reflected ray, the normal, the angle of incidence  $i$  and the angle of reflection  $r$ .



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**9.** State the two laws of reflection of light.



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**10.** Describe an experiment to verify the laws of reflection of light.



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**11.** A ray of light falls normally on a plane mirror. What is the angle of incidence ?



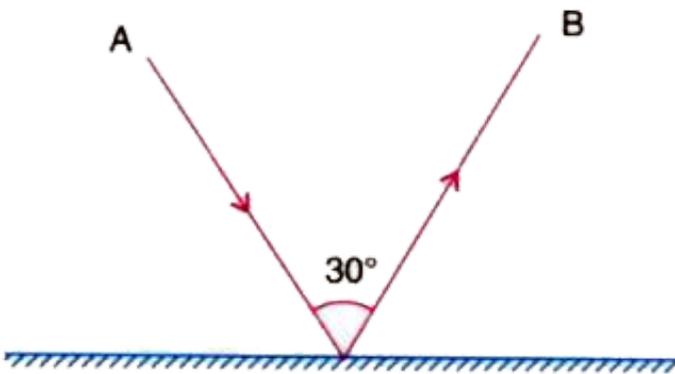
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**12.** Draw a diagram to show the reflection of a light ray incident normally on a plane mirror.



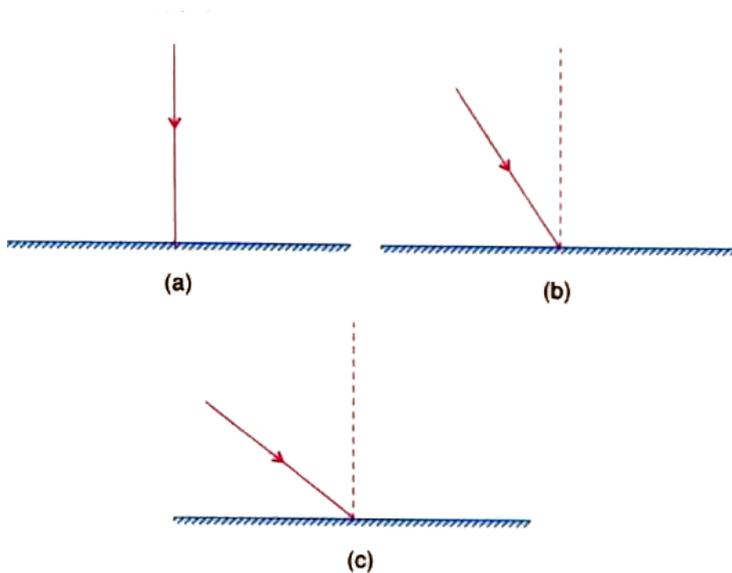
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13. The diagram in Fig shows an incident ray AO and the reflected ray OB from a plane mirror. The angle AOB is  $30^\circ$ . Draw normal on the plane mirror at the point O and find : (a) the angle of incidence (b) the angle of reflection



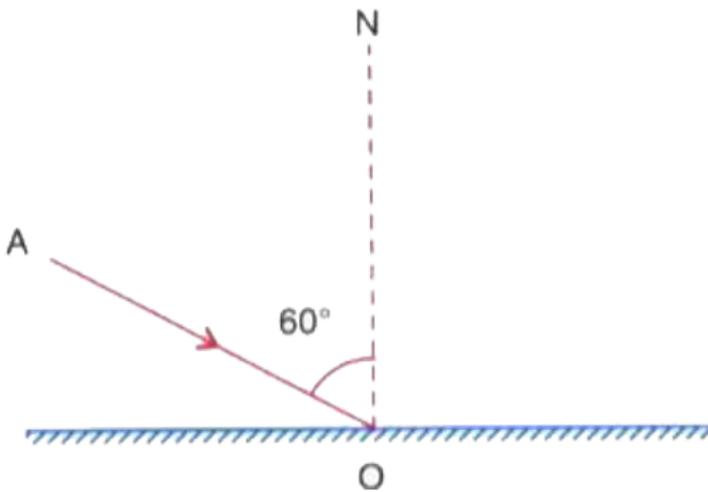
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14. In the following diagrams (Fig ), measure and write the angle of incidence and draw the reflected ray in each case.



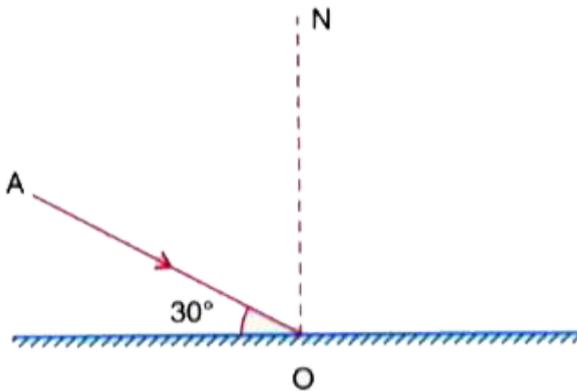
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15. The diagram in Fig. shows an incident ray AO and the normal ON on a plane mirror. Draw the reflected ray. State the law you use to draw the direction of the reflected ray.



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**16.** The following diagram (Fig) shows an incident ray AO and the normal ON on a plane mirror. Find the angle of incidence and angle of reflection.



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**17.** State in words, how do you find the location of image of an object formed by a plane mirror.



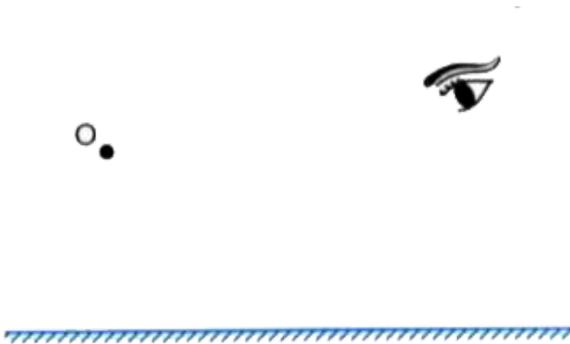
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**18.** Draw a ray diagram showing the formation of image of a point object by a plane mirror.



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**19.** The following diagram (Fig.) shows a point object O placed in front of a plane mirror. Take two rays from the point O and show how the image of O is formed and seen by the eye.



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**20.** State four characteristics of the image formed by a plane mirror



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**21.** How is the position of image formed by a plane mirror related to the position of the object ?



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**22.** You are standing at a distance 2 metre from a plane mirror.

What is the distance of your image from the mirror ?



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**23.** You are standing at a distance 2 metre from a plane mirror.

What is the distance between you and your image ?





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**24.** What is meant by lateral inversion of an image in a plane mirror ? Explain it with the help of a diagram.



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**25.** Write down the letter C and I as seen in a plane mirror.



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**26.** What is irregular reflection ? Give an example.



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**27.** How do we see objects around us?



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**28.** State two uses of a plane mirror.



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**29.** Can light travel in vacuum ?



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**30.** The speed of light in air is :



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**31.** State the speed of light in glass



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**32.** State whether light slows down or speeds up in the following cases :

Light going from air to glass.



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**33.** State whether light slows down or speeds up in the following cases :

Light going from glass to water.



**Watch Video Solution**

**34.** State whether light slows down or speeds up in the following cases :

Light going from water to air.



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**35.** What are primary colours ? Name the three primary colours.



**Watch Video Solution**

**36.** What are secondary colours ? Name the three secondary colours.



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**37.** Fill in the blanks with the appropriate colour :

Blue + ..... = Cyan



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**38.** Fill in the blanks with the appropriate colour :

Red + Blue + .....= White



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**39.** Fill in the blanks with the appropriate colour :

Red + Blue = .....



**Watch Video Solution**

**40.** Fill in the blanks with the appropriate colour :

Green + Red = .....



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**41.** The leaves appear green when seen in white light. Give a reason.



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**42.** A rose appears red in white light. How will it appear in green light ? Give a reason for each of your answers.



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**43.** A rose appears red in white light. How will it appear in red light ? Give a reason for each of your answers.



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**44.** Why does a piece of paper appear white in sunlight ? How would you expect it to appear when viewed in red light?



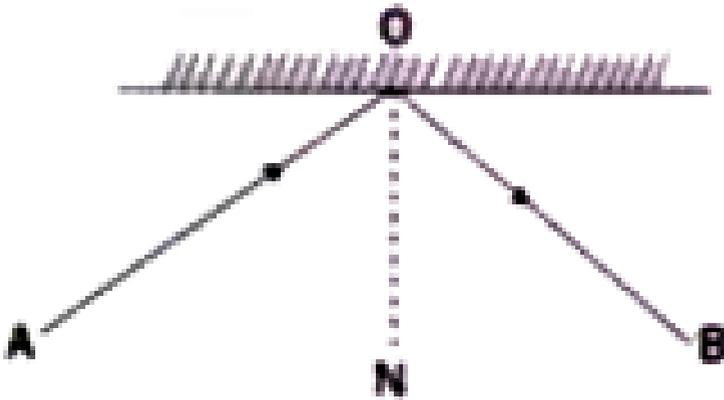
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**45.** A piece of paper appears black in sunlight. What will be its colour when seen in red light?



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1. Observe the figure and answer the question.

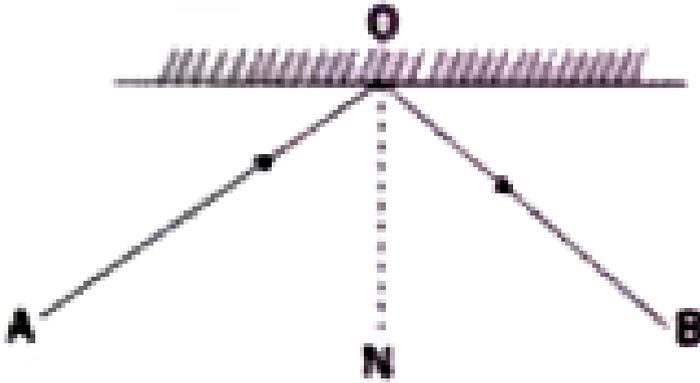


Mark *i*



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2. Observe the figure and answer the question.

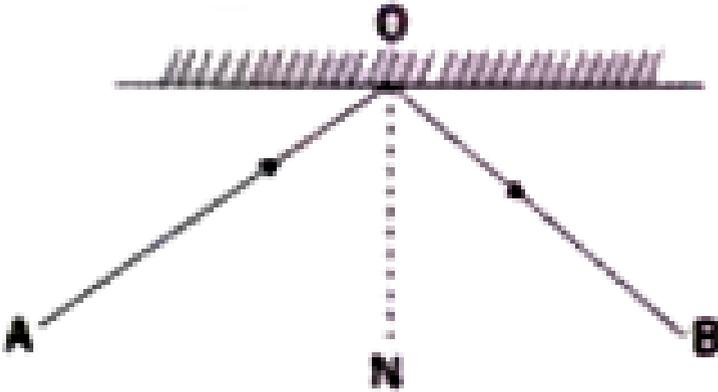


Mark r



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3. Observe the figure and answer the question.



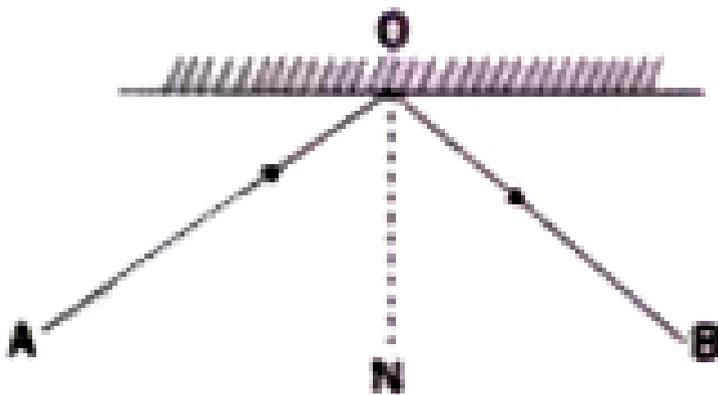
Line segment ..... ( $\angle OA / \angle ON$ )

represents the normal



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4. Observe the figure and answer the question.

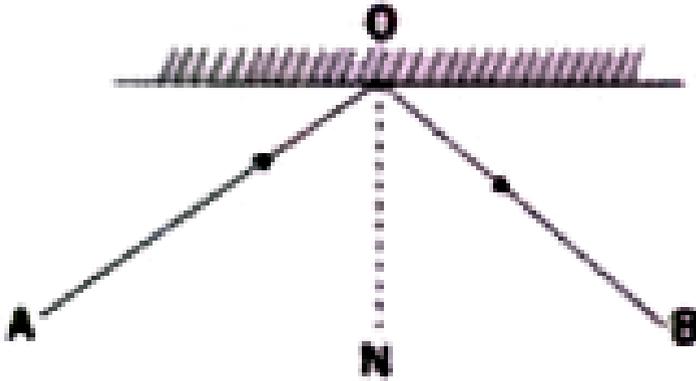


Angle .....( $\angle AON / \angle BON$ ) represents the angle of incidence.



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5. Observe the figure and answer the question.



Angle .....  
.....

$\angle AON$  //  $\angle BON$  represents the angle of reflection.

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6. What is the relationship between  $\angle AON$  and  $\angle NOB$ ?



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## Questions Write T For True And F For False

1. Virtual images cannot be obtained on a screen.



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2. Virtual image are always inverted



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3. Images formed by plane mirrors are erect.



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4. Image formed by plane mirrors are laterally inverted.



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5. Image formed by plane mirrors can be obtained on a screen.



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## Exercise Section I

1. Name the following

Bouncing back of light rays from a surface



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**2.** Name the following

The angle between the incident ray and the normal



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**3.** Name the following

Image which cannot be obtained on a screen



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4. Name the following

Lights of three different colours, mixed together to give white light



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5. Name the following

The colour we get when red light is mixed with green light



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**6.** Name the following

Colour mixing where one or more colours are removed from the incident light



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**7.** Name the following

Secondary colours formed by mixing of lights of different colours



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## Exercise Section I Choose The Correct Option

1. The ray of light that strikes or falls on a reflecting surface

A. Reflected ray

B. The normal

C. Incident ray

D. The point of incidence

**Answer:**



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2. If the angle of incidence is  $40^\circ$  then the angle of reflection will be

A.  $50^\circ$

B.  $40^\circ$

C.  $90^\circ$

D.  $45^\circ$

**Answer:**



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3. When a ray of light falls normally on a plane mirror. The angle of incidence will be

A.  $90^\circ$

B.  $0^\circ$

C.  $45^\circ$

D.  $180^\circ$

**Answer:**



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4. The image formed by a plane mirror is:

- A. Real and of same size
- B. Real and inverted
- C. Virtual and of same size
- D. Virtual and inverted

**Answer:**



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5. The primary colours of light are:

- A. Red, blue, and cyan
- B. Green, blue, and red
- C. Red, magenta, and blue
- D. Green, blue, and yellow

**Answer:**



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**Exercise Section I Write T For True And F For False Correct The False Statements**

1. The perpendicular line drawn on the surface of a mirror at the point of incidence is called the incident ray.



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2. Diffused reflection does not obey the laws of reflection.



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3. The image formed by a plane mirror is



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4. The speed of light is maximum in glass.



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5. Magenta is obtained by mixing red and blue.



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6. When you subtract green light from the white light, you get yellow colour



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## Exercise Section I Choose The Correct Option To Fill In The Blank

1. The ray of light that bounces off the mirror is called ..... incident ray/ reflected ray)



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2. Angle of reflection is the angle between the reflected ray and the ..... incident ray/normal).



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3. The incident ray, the reflected ray and the normal lie.....



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4. We see most of the things around us by  
.....(regular reflection/diffused reflection)



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5. Images that cannot be obtained on a screen  
are .....(real images/virtual images)



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6. If lights of red, blue, and green colour are projected on to a wall in correct proportion we get ..... (black/white) light.



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7. In colour TV we see colour due to .....  
(colour subtraction/colour addition)



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## 1. Give reason

Sometime we walk into a transparent glass partition.



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## 2. Give reason

Although most of the things around us are not luminous, we see them when light shines on them.



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### 3. Give reason

Only regular reflection can create a sharp image.



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### 4. Give reason

When we raise our right hand in the front of a mirror, it looks as if we have raised our left hand.



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### 5. Give reason

The image formed by a mirror is virtual whereas the image formed by a pinhole camera is real.



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### 6. Give reason

Red, blue, and green are called primary colours of light.



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### 7. Give reason

White paper looks white in sunlight whereas a red rose looks red in sunlight.



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### 8. Give reason

Yellow shirt is covered with a material that absorbs light of blue colour .



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## Exercise Section Ii Distinguish Between

1. Distinguish between Incident ray and reflected ray .



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2. Distinguish between Angle of incidence and angle of reflection .



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3. Distinguish between Regular and diffused reflection .



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4. State at least three differences between real and virtual images.



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5. Distinguish between Primary and secondary colours



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6. Distinguish between Colour addition and colour subtraction



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7. Distinguish between Cyan and magenta colour



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## Exercise Section II Short Answer Question

1. What do you mean by the term reflection of light ?



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2. State the laws of reflection.



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3. If the angle of reflection is  $45^\circ$ , what is the angle between the incident ray and the reflected ray?



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4. Draw the incident ray and the reflected ray. if a light ray is incident on a plane mirror with the angle of incidence  $30^\circ$ .



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5. Write three characteristics of the image formed by a plane mirror?



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6. State two uses of a plane mirror.



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7. What do you mean by lateral inversion of an image?



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8. How do you get secondary colours by colour addition?



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## Exercise Section II Long Answer Question

1. Define the reflection of light.



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2. Describe an experiment to verify the laws of reflection of light.



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**3.** Draw a ray diagram showing the formation of image of a point object by a plane mirror.



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**4.** What are primary and secondary colours of light? Why are they called so? Explain with examples.



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5. What do you mean by subtraction of colours? Explain with examples .



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## Exercise Picture Study

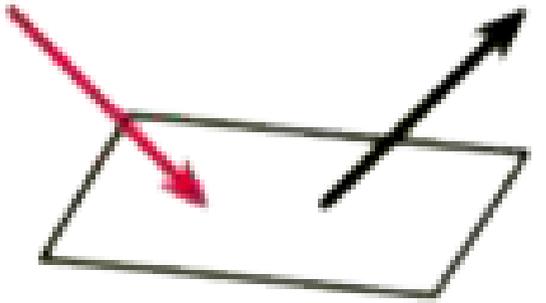
1. Do you know why AMBULANCE is written in a strange manner on the vehicle?



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2. What would be the colour reflected if the material absorbs blue?

**magenta light**



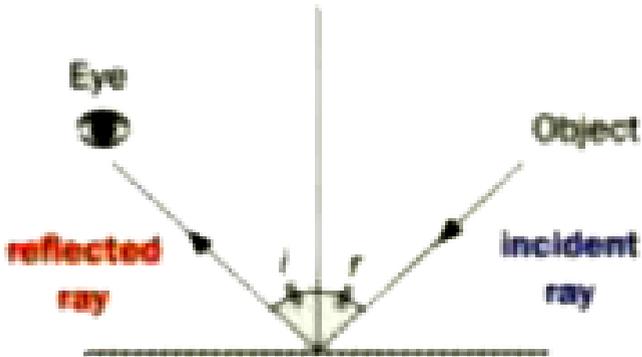
**Absorbs blue**



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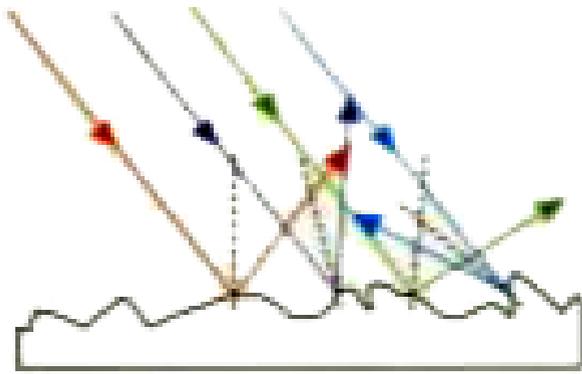
**3.** In the figure given, find out where the image appears to be by producing the reflected ray. Measure the distance from the object to the reflected mirror and also from the mirror to

the image. Is the distance equal?

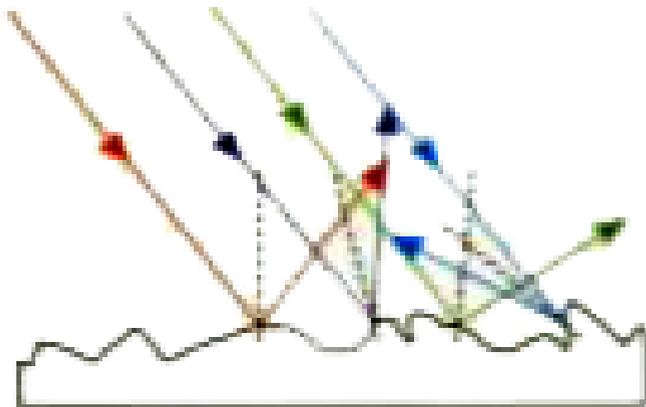


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4. In the following diagram, what kind of reflection is given?



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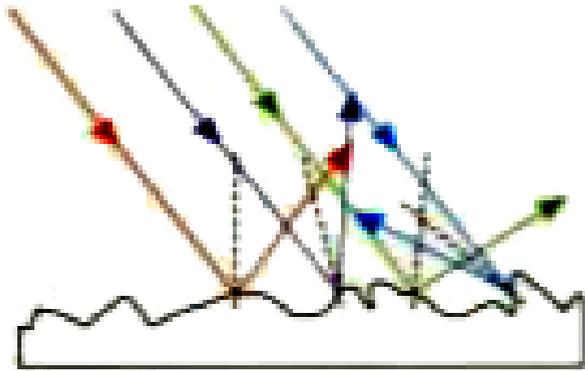
5.

Does this kind of reflection satisfy laws of

reflection?



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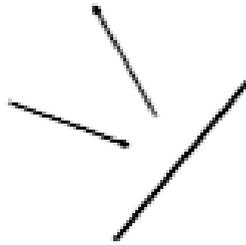
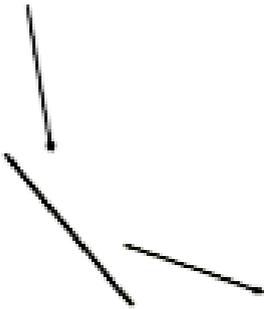
6.

What is the advantage of such kind of reflection?

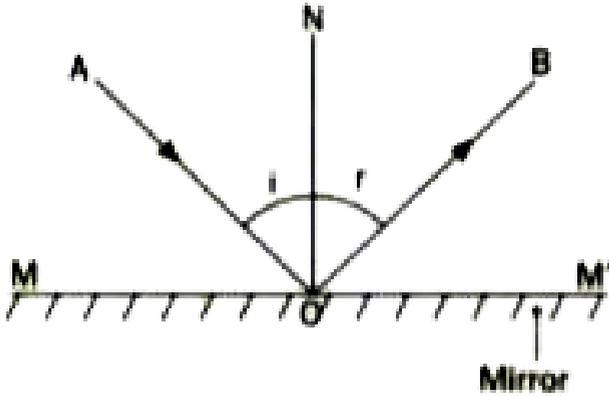


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7. In the following figures, draw the normal at the point of incidence and then find out its angle of incidence and angle of reflection



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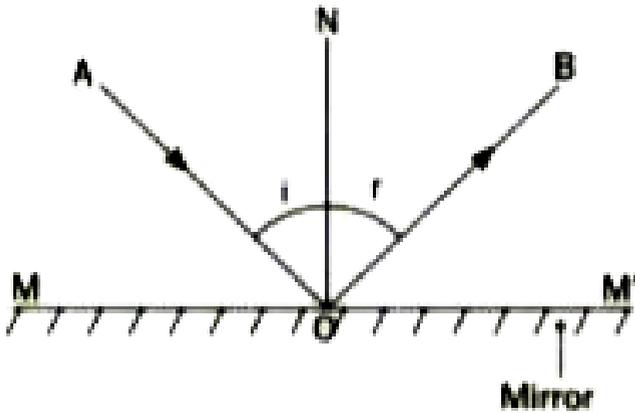


8.

If the following figure, if the angle between the mirror and incident ray is  $60^\circ$  find angle of incidence



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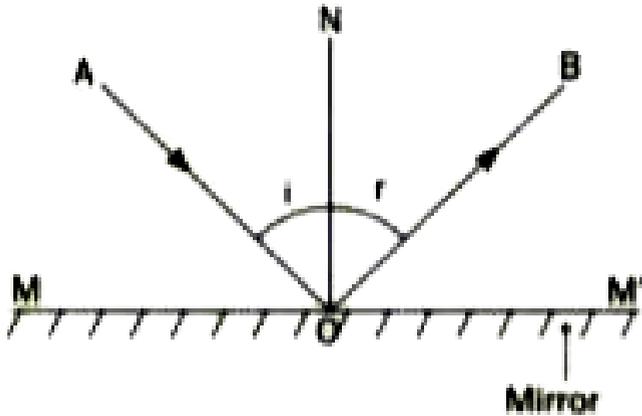


9.

If the following figure, if the angle between the mirror and incident ray is  $60^\circ$  find angle of reflection



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10.

If in the following figure, if the angle between the mirror and incident ray is  $60^\circ$  find angle between the reflected ray and the mirror



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