

# X: PHYSICS

## ONE MARKS QUESTIONS

### REFLECTION

**Q1:** Explain why a ray of light passing through the centre of curvature of a concave mirror gets reflected along the same path.

**Ans1:** This is because when ray of light passes through centre of curvature of a concave mirror it strikes the mirror at 90 degree that is it coincides with the Normal to the surface and therefore angle of incidence =  $0^\circ$  and hence by Laws of Reflection, the light re-trace the path after reflection.

**Q2:** What is the nature of image formed by a concave mirror if the magnification produced by the mirror is +3?

**Ans2:** The nature of the image will be virtual, erect and magnified with the image, three times the size of the object formed behind the concave mirror.

**Q3:** Write two different uses of concave mirrors.

**Ans3:** Concave mirrors can be used for many purposes out which four are listed below:-

(i) **Concave mirrors** are commonly **used in** torches, search-lights and vehicles headlights to get powerful parallel beams of light.

(ii) They are often used as **shaving mirrors** to see a larger image of the face.

(iii) The dentists use concave mirrors to see **large images of the teeth** of patients.

(iv) Large concave mirrors are used to **concentrate sunlight** to produce heat in solar furnaces.

**Q4:** An object is kept at a distance of 4m in front of a special mirror which forms its erect image at a distance of 1.0 m from the mirror. What is the magnification? Is the mirror concave or convex?

**Ans 4:** Given:  $u=4\text{m}$ ,  $v=1\text{m}$

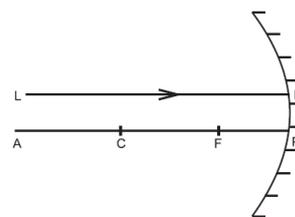
$$m = -v/u$$

by sign convention,  $u = -4\text{m}$

$$\therefore m = 1/4 = 0.2$$

as the magnification is positive and virtual and diminished hence the mirror could be convex.

**Q5:** A ray of light LM is incident on a mirror as shown in the figure. The angle of incidence for this ray is the angle between it and the line joining two other points in the figure. Name these two points.



**Ans5:** The line joins MC.

### REFRACTION

**Q6:** Why does a ray of light bend when it travels from one medium into another?

**Ans6:** The refraction of light (bending of light ray) depends upon the change in speed of light. if speed of light changes so it will bend when travelling from one medium to another. like when light enters into water the light ray bent because its speed slows down

**Q7:** Name the component of white light that has the greatest wavelength.

**Ans7:** The component of white light that has the greatest wavelength is **red**.

**Q8:** How should a ray of light be incident on a rectangular glass slab so that it comes out from the opposite side of the slab without being displaced?

**Ans8:** You should incident the ray of light perpendicular ( $90^\circ$  angle) to the glass **slab so that it comes out** from the opposite face **without being displaced**.

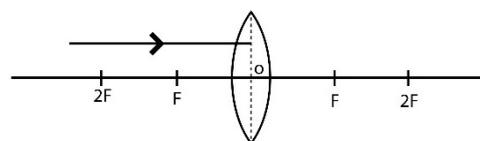
**Q9:** The following table gives the values of refractive indices of few media.

S.No.	1	2	3	4	5
Medium	Water	Crown Glass	Rock Salt	Ruby	Diamond
Refractive Index	1.33	1.52	1.54	1.71	2.42

Use this table to give an example of a medium pair so that light speeds up when it goes from one of these media to another.

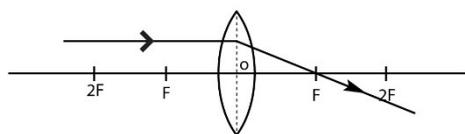
**Ans 9:** Light speed up when it travels from denser medium to rarer medium. So, travelling from Crown Glass to Water speeds up.

**Q10:** Draw the given diagram in your answer book and complete it for the path of ray of light beyond the lens.



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Ans 10:



Q11: A girl was playing with a thin beam of light from her laser torch by directing it from different directions on a convex lens held vertically. She was surprised to see that in a particular direction the beam of light continues to move along the same direction through the lens. State the reason for this observation.

Ans11: The girl must have directed the ray of light along the direction of the optical centre of the lens because the ray of light passes straight through the optical centre of the lens.

Q12: Define power of a lens.

Ans12:

(i) The degree of convergence or divergence of light rays by a lens is termed as power of the lens.

(ii) The power of a lens is defined as the reciprocal of its focal length. It is represented by the letter  $P$ . The power  $P$  of a lens of focal length  $f$  is given by:

$$P = \frac{1}{f}$$

(iii) The SI unit of power of a lens is 'diopetre'. It is denoted by the letter D. If  $f$  is expressed in metres, then, power is expressed in diopetres.

### HUMAN EYE

Q13: Name the part of our eyes that helps us to focus near and distant objects in quick succession.

Ans13: Ciliary muscles.

### NATURAL PHENOMENA

Q14: Why does sky look blue on a clear day?

Ans14: A **clear** cloudless **day-time sky** is **blue** because molecules in the air scatter **blue** light from the sun more than they scatter red light.

Q15: List the three phenomena of light responsible for formation of rainbow in the sky?

Ans15: The three phenomena's are:-

- (i) Total internal reflection
- (ii) Refraction
- (iii) dispersion

Q16: Why do we see stars twinkling whereas, planets do not twinkle?

Ans16: **Planets**, just like the Sun, **do not twinkle**. **Planets** are also closer to the Earth than those distant **stars**,

so **planets** appear larger in comparison. Due to the **planets'** closeness to Earth, the light coming from these celestial bodies **does not** bend much due to Earth's atmosphere.

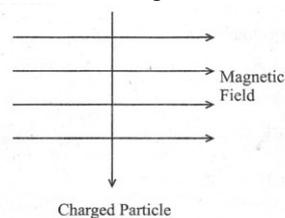
### ELECTRICITY

Q17: Generally, alloys are used in electrical heating devices instead of pure metals. What could be the reason?

Ans17: Conductor of electric heating devices such as toaster or electric iron is made of an alloy rather than pure metal because if electric heating devices are made up of pure metal then the metal melt easily when heat is increase and pure metal get corrode easily. Alloy does not corrode easily and its melting point is high, so that we use alloy rather than pure metal.

### MAGNETISM

Q18: A charged particle enters at right angles into a uniform magnetic field as shown. What should be the nature of charge on the particle if it begins to move in a direction pointing vertically out of the page due to its interaction with the magnetic field?



Ans18: The particle is positively charged.

