WORKSHEET 2

CHAPTER 5 – REFRACTION THROUGH LENSES

A. Tick (✓) the correct option.

1. A lens thinner at the centre and thicker at the edges is called

   a. convex lens. b. biconvex lens. c. concave lens. d. none of these.

2. One dioptre is the power of lens whose focal length is

   a. 1 m. b. 10 m. c. 1000 m. d. none of these.

3. Power of a concave lens of focal length 20 cm is

   a. 5 D. b. 10 D. c. –5 D. d. –10 D.

4. The power P of a combination of two lenses of powers P_1 and P_2 each is given by

   a. $P_1 - P_2$. b. P_1P_2. c. P_1/P_2. d. $P_1 + P_2$.

5. If the image produced is virtual and erect then the magnification is

   a. positive. b. negative. c. zero. d. infinity.

B. Fill in the blanks.

1. _____ lens is used for the correction of hypermetropia.
2. Concave lens has a _____ focus.
3. Radius of the sphere of which the lens surface is a part is called _____
4. A _____ is a piece of transparent, optical material bounded by two refracting surfaces which are usually spherical.
5. The line joining the centres of curvature of the two refracting surfaces of the lens is called _____

C. State whether the following statements are true or false.

1. Concave lens is also called a diverging lens.
2. Convex lens is used for the correction of myopia.
3. Power of a convex lens is negative.
4. A concave lens is used as the eyelens is Galilean telescope.
5. A convex lens produces a virtual and erect image when the object is placed between 0 and F_1.

D. Match the following.

1. Lens formula $P = \frac{1}{f}$
2. Correction of myopia $\frac{1}{f} = \frac{1}{v} - \frac{1}{u}$

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3. SI unit of power of lens — $m = \frac{v}{u}$
4. Magnification produced by a lens — dioptre (D)
5. Power of a lens — concave lens

E. Answer the following questions.

Very short answer questions

1. What are the two different types of lenses?
2. Why is convex lens called a converging lens?

Short answer questions

1. Define linear magnification of the lens.
2. State the magnifying power of simple microscope when image is at least distance of distinct vision.

Long answer questions

1. Give two applications of lenses.
2. If the power of a thin lens is –10 D. When is its focal length and nature?

ANSWERS

WORKSHEET 2

A. Tick (✓) the correct option.

1. c 2. a 3. c 4. d 5. a

B. Fill in the blanks.

1. Convex 2. virtual 3. radius of curvature 4. lens 5. principal axis

C. State whether the following statements are true or false.

1. T 2. F 3. T 4. T 5. T

D. Match the following.

1. Lens formula — $\frac{1}{f} = \frac{1}{v} - \frac{1}{u}$
2. Correction of myopia — concave lens
3. SI unit of power of lens — dioptre (D)
4. Magnification produced by a lens — $m = \frac{v}{u}$
5. Power of a lens — $P = \frac{1}{f}$

E. Answer the following questions.

Very short answer questions

1. The two different types of lenses are
   i. convex lens
   ii. concave lens
2. The convex lens converges the parallel beam of light at a point. Therefore, a convex lens is also called a converging lens.

Sort answer questions

1. The linear magnification of a lens is defined as the ratio of the height of the image to the height of the object.
2. Magnifying power = $1 + \frac{D}{f}$

Long answer questions

1. Two applications of lenses are
   i. Convex lenses are used in photographic camera, microscopes, telescopes and film projectors.
   ii. A combination of concave lens with convex lens is used to make high quality lens system for optical instruments.
2. $$\text{Power} = -10 \text{ D}$$
$$P = \frac{1}{f}$$
$$-10 = \frac{1}{f}$$
$$f = \frac{1}{-10} = -0.1 \text{ m}$$

Since the focal length is negative, therefore, it is a concave lens.