WORKSHEET ①

A. Tick (✓) the correct option.

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

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

2. The geometrical centre of the lens is called

   a. aperture.   b. focus.   c. optical centre.   d. principal axis.

3. If the media on both sides of the lens are same then

   a. $f_1 > f_2$ b. $f_1 = f_2$ c. $f_1 < f_2$ d. None of these

4. SI unit of power of a lens is

   a. dyne.   b. joule.   c. watt.   d. dioptre.

5. Power of convex lens of focal length 10 cm is

   a. 5 D.   b. 10 D.   c. 2.5 D.   d. –10 D.

B. Fill in the blanks.

1. According to the new cartesian sign convention, the distances measured in the direction of incident ray are _____

2. The power of a lens is defined as the reciprocal of its _____

3. _____ lens is used for the correction of myopia.

4. A ray of light passing through the _____, emerges without any deviation.

5. _____ lens has a real focus.

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

1. Convex lens converges the parallel beam of light at a point.

2. A concave lens has a real focus.

3. The image formed by a concave lens is real and inverted.

4. One dioptre is the power of a lens whose focal length is one metre.

5. In film and slide projector, the object is placed between F_1 and $2F_1$ of the convex lens.

D. Match the following.

1. Real focus   virtual and real image

2. Positive magnification   concave lens

3. SI unit of focal length   real and inverted image

4. Virtual focus   metre (m)

5. Negative magnification   convex lens

Name: ....   Teacher's signature: ....

Class: ....X................................   Date: ....

E. Answer the following questions.

Very short answer questions

1. Define one dioptre.
2. Name the lens used in Galilean telescope.

Short answer questions

1. Define centre of curvature of a lens.
2. What is the power of a lens whose focal length is 20 cm?

Long answer questions

1. Differentiate between virtual image and real image.
2. Two thin lenses of power +3.5 D and –3 D are placed in contact. Find the power and the focal length of the lens combination.

ANSWERS

WORKSHEET 1

A. Tick (✓) the correct option.

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

B. Fill in the blanks.

1. positive   2. focal length   3. Concave   4. optical centre   5. Convex

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

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

D. Match the following.

1. Real focus   convex lens
2. Positive magnification   virtual and real image
3. SI unit of focal length   metre (m)
4. Virtual fous   concave lens
5. Negative magnification   real and inverted image

E. Answer the following questions.

Very short answer questions

1. One dioptre is the power of a lens whose focal length is one metre.
2. Concave lens

Short answer questions

1. The centre of curvature of a lens is defined as the centre of the spherical surface from which the lens has been cut.

2.
$$\text{Focal length} = 20 \text{ cm}$$
$$= \frac{20}{100}\text{m}$$
$$\text{Power} = \frac{1}{f} = \frac{100}{20} = 5 \text{ D}$$

Long answer questions

1. Refer Table 5.2, Page 103 of the textbook.

2.
$$P_1 = +3.5 \text{ D}$$
$$P_2 = -3 \text{ D}$$
$$\text{Power of the combination of lens} = P_1 + P_2 = 3.5 + (-3) = 0.5 \text{ D}$$

We know,
$$P = \frac{1}{\text{focal length}}$$
$$0.5 = \frac{1}{f}$$
$$f = \frac{1}{0.5} = 2 \text{ m}$$