ST. LAWRENCE HIGH SCHOOL

A JESUIT CHRISTIAN MINORITY INSTITUTION

SOLUTION TO WORK SHEET: 45.

Subject : PHYSICS

Date : 16.01. 2021

CLASS : XII

Chapter-Optical instruments

Topic: Defects of vision & their remedies, microscope, telescope.

Multiple choice questions : 1 X 15 = 15

1. If tube length of astronomical telescope is 105 cm and magnifying power is 20 for normal setting, calculate the focal length of objective.

   (a) 100 cm (b) 10 cm (c) 20 cm (d) 25 cm

   Ans. (a) 100 cm

2. A man with defective eyes cannot see distinctly objects at distances more than 60 cm from his eyes. The power of the lens to be used will be

   (a) + 60 D (b) - 60 D (c) - 1.66 D (d) $\frac{1}{1.66}$ D

   Ans. (c) - 1.66 D

3. The length of a telescope is 36 cm. The focal lengths of its lenses can be

   (a) 30 cm , 6 cm (b) – 30 cm, - 6 cm (c) 30 cm, - 6 cm (d) - 30 cm. 6 cm

   Ans. (c) 30 cm, - 6 cm

4. An astronomical telescope of ten-fold angular magnification has a length of 44 cm. The focal length of the objective is

   (a) 4 cm . (b) 40 cm (c) 44 cm (d) 440 cm

   Ans. (b) 40 cm

5. For normal setting of a telescope

   (a) only the object is at infinity (b) only the final image is at infinity
   (c) both the object and the final image are at infinity
   (d) neither the object nor the final image has to be infinity.

   Ans. (c) both the object and the final image are at infinity

6. A person using a lens as simple microscope sees an

   (a) inverted virtual image (b) inverted real magnified image
   (e) upright virtual image (d) upright real magnified image.

   Ans. (e) upright virtual image

7. The magnifying power of a telescope is m. If the focal length of the eyepiece be doubled, then its magnifying power will become

   (a) 2 m (b) $\frac{m}{2}$ (c) $\sqrt{2m}$ (d) 3 m

   Ans. b) $\frac{m}{2}$

8. While viewing a distant object with a telescope, suddenly a housefly sits on the objective lens. The correct statement is that

(a) housefly will be seen enlarged in image. (b) housefly will be seen reduced in image.
(c) Intensity of image will be decreased (d) Intensity of image will be increased.

Ans. (c) Intensity of image will be decreased

9. The magnifying power of a simple microscope M is given by

(a) $M = 1 + \frac{F}{D}$ (b) $M = \frac{v}{u}$ (c) $M = \frac{u}{v}$ (d) $M = 1 + \frac{D}{F}$

Ans. (d) $M = 1 + \frac{D}{F}$

10. The astronomical telescope consists of objective and eye piece. The focal length of the object is

(a) equal to that of the eye piece (b) greater than that of the eye piece
(c) shorter than that of the eye piece (d) five times shorter than that of the eye piece.

Ans. (b) greater than that of the eye piece

11. A person uses spectacles of power + 2D. He is suffering from

(a) short sightedness or myopia (b) long sightedness of hypermetropia
(c) presbyopia (d) astigmatism

Ans. (b) long sightedness of hypermetropia

12. A doctor advises a patient to use spectacles with a convex lens of focal length 40 cm in contact with a concave lens of focal length 25 cm. What is the power of the combination ?

(a) - 6.5 D (b) - 1.5 D (c) 6.5 D (d) 1.5 D

Ans. (b) - 1.5 D

13. A compound microscope has two lenses. The magnifying power of one is 5 and the combined power is 100. The magnifying power of the other lens is

(a) 15 (b) 20 (c) 50 (d) 25

Ans. (b) 20

14. Magnifying power of a telescope can be increased by

(a) increasing the length of the telescope (b) increasing the focal length of objective
(c) increasing the diameter of objective (d) increasing the focal length of eye piece

Ans. (b) increasing the focal length of objective

15. The far point of a myopic eye is 1.5 m. To correct this defect of the eye, the power of the lens

(a) - 0.66 D (b) + 0.66 D (c) + 1.5 D (d) - 1.5 D

Ans. (a) - 0.66 D