ST. LAWRENCE HIGH SCHOOL

A JESUIT CHRISTIAN MINORITY INSTITUTION

SOLUTION TO WORK SHEET: 36

Subject : PHYSICS

Date : 09.11.2020

CLASS : XII

Chapter: Reflection of light

Topic: Spherical mirror, linear and angular magnification,Newton's equation,u-v graph.

Multiple Choice Questions : **1 x 15 = 15**

1: A ray passing through or directed towards centre of curvature of a spherical mirror is reflected such that it trace back of its path, because

(a) it does not follow law of reflection (b) angle of incidence is 0^0

(c) centre of curvature is midway between object and pole

(d) distance of centre of curvature from focus is equal to its distance from pole

Ans. (b) angle of incidence is 0^0

2: If lower half of a concave mirror is blackened, then

(a) image distance increases (b) image distance decreases

(c) image intensity increases (d) image intensity decreases

Ans. (d) image intensity decreases

3: An object is placed at 10 cm from a concave mirror of raius of curvature 15 cm, then

(a) it forms an erect image (b) it forms a small and inverted image

(c) it forms is point image (d) it forms a magnified, real inverted image

Ans. (d) it forms a magnified, real inverted image

4: Rear view mirror of a car is of radius of curvature R = 2 m. A jogger approaches car (from behind) at a speed of 5 ms^{-1}. The speed of image, when jogger is 39m from the mirror, is

(a) 0.3 cms^{-1} (b) 0.1 cms^{-1} (c) 0.5 cms^{-1} (d) 1.5 cms^{-1}

Ans. (a) 0.3 cms^{-1}

5: A short linear object of length b lies along the axis of a concave mirror of focal length f at a distance u from the pole of the mirror. The size of the image is approximate equal to

(a) $b\left(\frac{u-f}{f}\right)^{1/2}$ (b) $b\left(\frac{f}{u-f}\right)^{1/2}$ (c) $b\left(\frac{u-f}{f}\right)$ (d) $b\left(\frac{f}{u-f}\right)^2$

Ans. (d) $b\left(\frac{f}{u-f}\right)^2$

6: A concave mirror of focal length f_1 is placed at a distance of d from a convex lens of focal length f_2. A beam of light coming from infinity and falling on this convex lens-concve mirror combination returns to infinity. The distance must d be equal

(a) $f_1 + f_2$ (b) $-f_1 + f_2$ (c) $2f_1 + f_2$ (d) $-2f_1 + f_2$

Ans. (c) $2f_1 + f_2$

7: An object 2 cm bigh is placed at a distance of 16 cm from a concave mirror, which produces a real image 3 cm high. What is the focal length of the mirror ?

(a) - 9.6 cm (b) - 3.6 cm (c) - 6.3 cm (d) - 8.3 cm

Ans. (a) - 9.6 cm

8: A rod of length 30 cm lies along the principal axis of a concave mirror of focal length 10 cm in such a way that its end closer to the pole is 20 cm away from the mirror. The length of the image is

(a) 10 cm (b) 15 cm (c) 2.5 cm (d) 5 cm

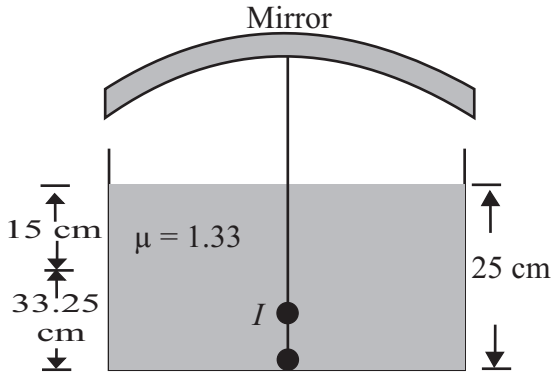
Ans. (b) 15 cm

9: A concave mirror has a radius of curvature of 20 cm. The image of a object formed in mirror is 2.50 times the size of the object. How far is the mirror from the object ?

(a) 5.5 cm (b) 40 cm (c) 6 cm (d) 10 cm

Ans. (c) 6 cm

10: A container is filled with water ($\mu = 1.33$) upto a height of 33.25 cm. A concave mirror is placed 15cm above the water level and the image of an object placed at the bottom is formed 25 cm below the water level. The focal length of the mirror is

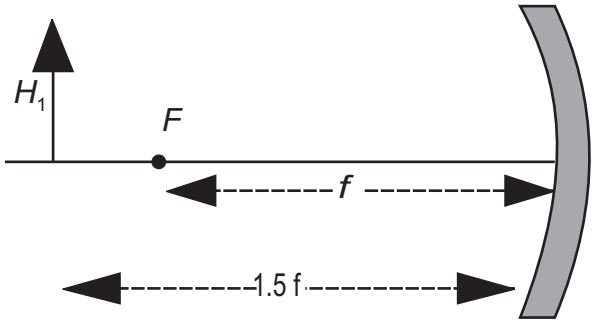


(a) 10 cm (b) 15 cm

(c)-18.3 cm (d) 25 cm

Ans. (c)-18.3 cm

11: In the following figure, if height of an object is $H_1 = +2.5$ cm. then height of the image H_2 formed is



(a) - 5 cm (b) +5 cm (c) +7.5 cm (d) -7.5 cm

Ans. (a) - 5 cm

12: If the object distance and image distance from the focus of a spherical mirror of focal length f be x and y respectively, then

(a) $xy = f$ (b) $xy = f^2$ (c) $\frac{x}{y} = f$ (d) $xy = f^3$

Ans. (b) $xy = f^2$

13: If a graph is drawn taking x an y as the object distance and the image distance respectively from the focus of a spherical mirror, the graph will be a

(a) rectangular hyperbola (b) parabola

(c) circle (d) ellipse

Ans. (a) rectangular hyperbola

14: Image that indicates positive magnification is

(a) erect (b) inverted

(c) larger than the size of the object (d) smaller than the size of the object

Ans. (b) inverted

15: An object is approaching a convex mirror. The ratio of the velocity of the object and that of its image which is m times magnified is

(a) $-\frac{1}{m^2}$ (b) m^2 (c) $-m$ (d) $\frac{1}{m}$

Ans. (a) $-\frac{1}{m^2}$