

# Unit 6 - Week 4

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## Assignment 4

The due date for submitting this assignment has passed. **Due on 2019-08-28, 23:59 IST.**  
 As per our records you have not submitted this assignment.

1) Two lenses of power -10D and 5D are in contact with each other  
 What is focal length of this combination?  
 (a) 10 cm  
 (b) 20 cm  
 (c) -5 cm  
 (d) -20 cm

a  
 b  
 c  
 d

No, the answer is incorrect.  
 Score: 0  
 Accepted Answers: d

2) A converging lens produces a real, magnified and well defined image of a small illuminated square on a screen. The area of the image is  $A_1$ . When the lens is moved towards the screen without disturbing the object and the screen, the area of the well defined image obtained on the screen is  $A_2$ . What is the side of the square object?  
 (a)  $(\sqrt{A_1} + \sqrt{A_2})/2$   
 (b)  $[(A_1 + A_2)/2]^{1/2}$   
 (c)  $(A_1 A_2)^{1/2}$   
 (d)  $(A_1 A_2)^{1/4}$

a  
 b  
 c  
 d

No, the answer is incorrect.  
 Score: 0  
 Accepted Answers: d

3) A man is shaving with his chin 0.4m from a concave magnifying mirror. If the linear magnification is 2.5, what is the radius of curvature of the mirror?  
 (a) 1.73 m  
 (b) -1.52 m  
 (c) 1.45 m  
 (d) None of those

a  
 b  
 c  
 d

No, the answer is incorrect.  
 Score: 0  
 Accepted Answers: d

4) Consider coaxial system of two thin convex lenses of focal length  $f$  each separated by a distance  $d$ . Draw a ray diagram for image formation corresponding to an object at infinity placed on the principal axis in the following case:  $d = 2f$

(a)

(b)

(c)

(d)

No, the answer is incorrect.  
 Score: 0  
 Accepted Answers: d

5) The apparent depth of water in a cylindrical water tank of diameter  $2R$  cm is reducing at the rate of  $x$  cm/minute when water is being drained out at a constant rate. The amount of water drained in c.c. per minute is ( $n_1 =$  refractive index of air,  $n_2 =$  refractive index of water)  
 (a)  $x \pi R^2 n_2/n_1$   
 (b)  $x \pi R^2 n_1/n_2$   
 (c)  $2 \pi R n_1/n_2$   
 (d)  $\pi R^2 x$

a  
 b  
 c  
 d

No, the answer is incorrect.  
 Score: 0  
 Accepted Answers: b

6) A telescope has an objective lens of focal length 200 cm and an eye piece with focal length 2 cm. If the telescope is used to see a 50 m tall building at a distance of 2 km, what is the length of the image of the building formed by the objective lens?  
 (a) 5 cm  
 (b) 10 cm  
 (c) 1 cm  
 (d) 2cm

a  
 b  
 c  
 d

No, the answer is incorrect.  
 Score: 0  
 Accepted Answers: a

7) A glass jar has the plane inner surface PQ of its bottom silvered and contains water (of refractive index  $n = 4/3$ ) column of height  $t = 6$  cm. A small light emitting diode (LED) is arranged at O a height  $d = 8$  cm from the water surface AB (Fig.). The silvered bottom of the jar acts as a plane mirror. At what distance from the free surface (AB) of water will this plane mirror form the image of the light emitting diode?

(a) 11 cm  
 (b) 14 cm  
 (c) 17 cm  
 (d) 18 cm

a  
 b  
 c  
 d

No, the answer is incorrect.  
 Score: 0  
 Accepted Answers: c

8) In an optics experiment, with the position of the object fixed, a student varies the position of a convex lens and for each position; the screen is adjusted to get a clear image of the object. A graph between the object distance  $u$  and the image distance  $v$ , from the lens, is plotted using the same scale for the two axes. A straight line passing through the origin and making an angle of  $45^\circ$  with the x-axis meets the experimental curve at P. The coordinates of P will be  
 (a)  $(4f, 4f)$   
 (b)  $(2f, 2f)$   
 (c)  $(f/2, f/2)$   
 (d)  $(f, f)$

a  
 b  
 c  
 d

No, the answer is incorrect.  
 Score: 0  
 Accepted Answers: b

9) A distance object is being seen by a telescope. If a fly sits on the objective:  
 (a) Enlarged and erect image of fly will be seen  
 (b) Diminished and inverted image will be seen  
 (a) Real image of the same size of fly will be seen  
 (d) Fly will not be seen, only the light intensity will be reduced

a  
 b  
 c  
 d

No, the answer is incorrect.  
 Score: 0  
 Accepted Answers: d

10) The position of final image formed by the given lens combination from the third lens will be at a distance of  
 (a) 15 cm  
 (b) infinity  
 (c) 45 cm  
 (d) 30 cm

a  
 b  
 c  
 d

No, the answer is incorrect.  
 Score: 0  
 Accepted Answers: d

11) The apparent depth of a liquid in a partly filled tank is 1.5 m. More liquid is poured in the tank of height 1 m. Now the apparent depth appears to be 2.1 m. Find the refractive index of liquid using above data.  
 (a) 4/3  
 (b) 3/2  
 (c) 5/3  
 (d) None of those

a  
 b  
 c  
 d

No, the answer is incorrect.  
 Score: 0  
 Accepted Answers: c