

# Unit 5 - Week 3

**Course outline**

How to access the portal?

**Week 0 Assignment 0**

**Week 1**

**Week 2**

**Week 3**

- Lecture 11 : Basic idea on mirrors and lenses and their applications
- Lecture 12 : Determination of focal length of concave mirror
- Lecture 13 : Determination of focal length of concave mirror (Contd.)
- Lecture 14 : Determination of focal length of convex mirror
- Lecture 15 : Determination of focal length of convex lens

**Week 4**

**Week 5**

**Week 6**

**Week 7**

**Week 8**

**Week 9**

**Week 10**

**Week 11**

**Week 12**

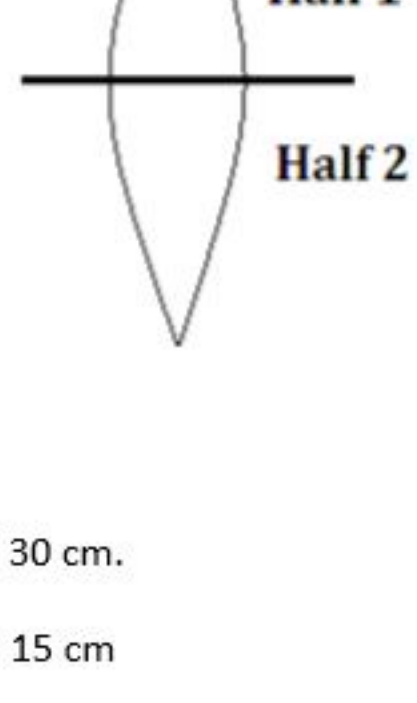
**Assignment Solution**

**Text Transcripts**

## Assignment 3

The due date for submitting this assignment has passed. **Due on 2019-08-21, 23:59 IST.**  
As per our records you have not submitted this assignment.

1) An equi convex lens of focal length 15 cm is cut into two halves. What is the focal length of each half?

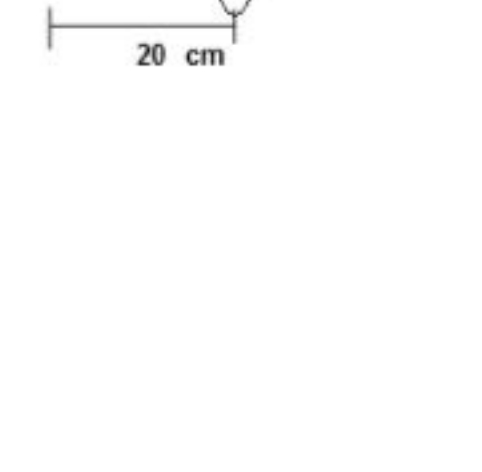


- (a) 30 cm.
- (b) 15 cm
- (c) 7.5 cm
- (d) No half will act as lens

- a
- b
- c
- d

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

2) A convex lens of focal length 10 cm is painted black at the middle portion for 2 cm. An object is placed at a distance of 20 cm from the lens then how many images are formed.



- (a) one
- (b) two
- (c) three
- (d) no image will be formed

- a
- b
- c
- d

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

3) A concave mirror and a concave lens (made of glass) are held in water. What changes, if any, do you expect in their focal lengths?

- (a) Focal length of both will increase.
- (b) Focal length of both will decrease
- (c) Focal length of lens will increase and there will be no change for mirror.
- (d) Focal length of lens will increase and that of mirror will decrease.

- a
- b
- c
- d

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

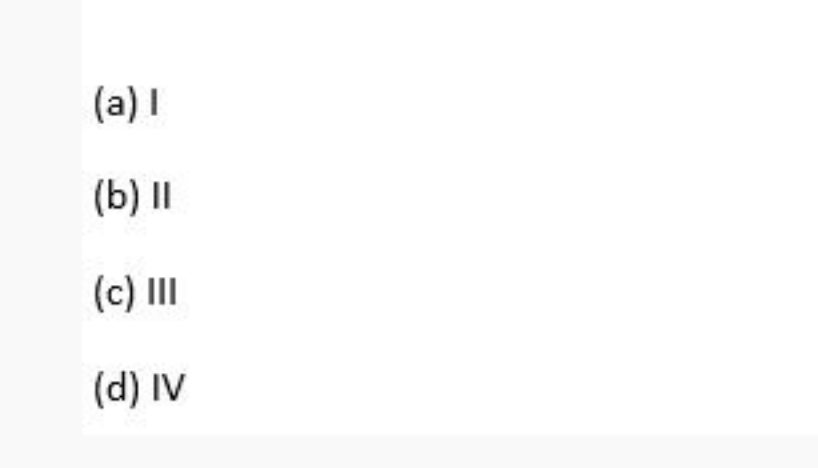
4) The following data was recorded for values of object distance and the corresponding values of image distance in the experiment on study of real image formation by a convex lens of power +5D. One of these observations is incorrect. Identify this.

S.No.	1	2	3	4
Object distance (cm)	25	30	35	45
Image distance (cm)	97	61	37	35

- (a) 1
- (b) 2
- (c) 3
- (d) 4

- a
- b
- c
- d

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



A spherical, concave mirror is shown in the figure above. The focal point F and the location of the Object O are indicated. At what point will the image be located?

- (a) I
- (b) II
- (c) III
- (d) IV

- a
- b
- c
- d

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

6) The lens shown in the figure is made of two different transparent materials. A point object is placed on its axis. How many images of the object will be formed?

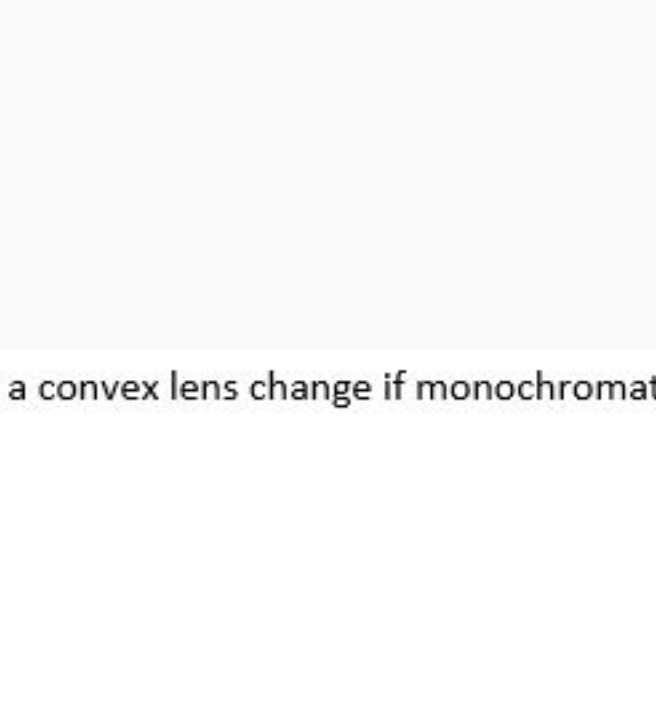


- (a) 1
- (b) 2
- (c) 3
- (d) 7

- a
- b
- c
- d

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

7) A concave lens is immersed in a liquid and image formed is shown in the figure. Whose refractive index is greater, glass or the liquid?



- (a) Glass
- (b) Liquid
- (c) Both are of same refractive index
- (d) Data insufficient

- a
- b
- c
- d

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

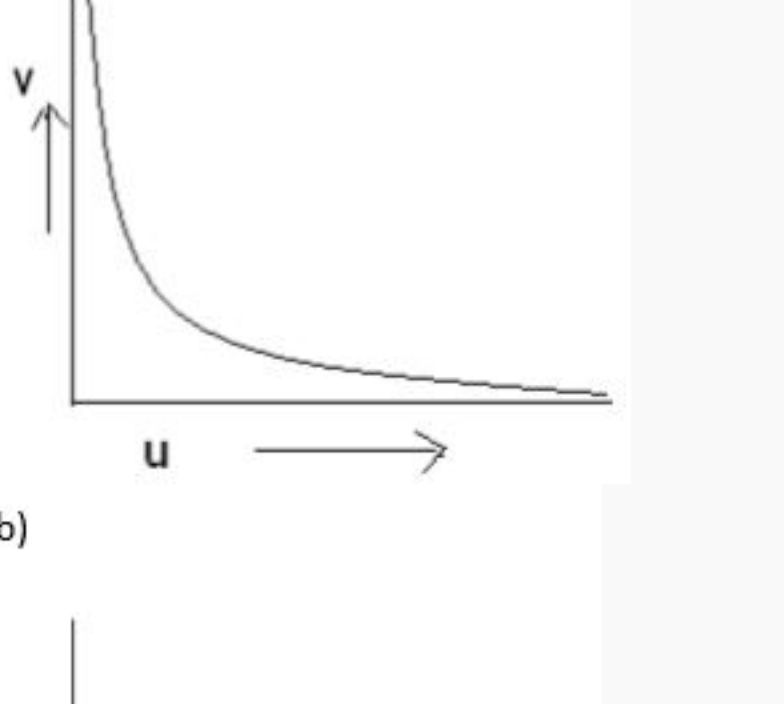
8) How does the focal length of a convex lens change if monochromatic red light is used instead of monochromatic blue light?

- (a) Increase
- (b) Decreases
- (c) Does not depend upon the colour of light
- (d) Data insufficient

- a
- b
- c
- d

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

9) A small plane mirror is attached to the suspension wire of moving coil galvanometer. When the light from a lamp falls on the mirror, it retraces the path and puts a spot on the screen, 1.5m away from the mirror. What is the displacement of the spot if the coil deflects 3.5°?



- (a) 9.2 cm
- (b) 18.4 cm
- (c) 1.5 cm
- (d) Data insufficient

- a
- b
- c
- d

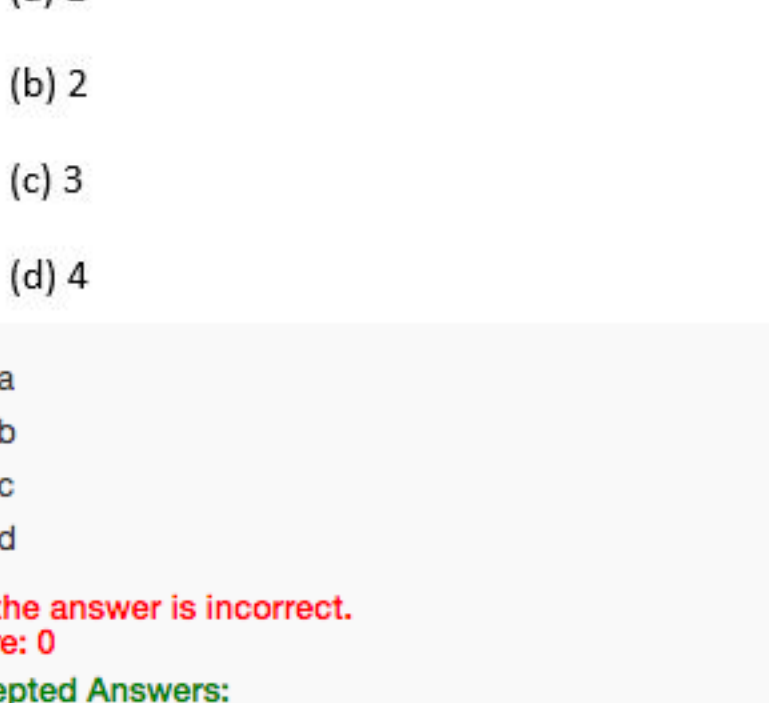
No, the answer is incorrect.  
Score: 0  
Accepted Answers: b

10) Which of the graph showing the variation of v with u for a convex lens.

- (a)
- (b)
- (c)
- (d)

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

11) A converging lens is made of 3 portions (1, 2 and 3 in fig.) of three different transparent materials of refractive indices  $n_1$ ,  $n_2$  and  $n_3$  respectively. A beam of monochromatic light from a distant object, proceeding parallel to the principal axis, is incident on this lens. How many images will be formed?



- (a) 1
- (b) 2
- (c) 3
- (d) 4

- a
- b
- c
- d

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

12) Pick out the incorrect statement:

- (a) The refractive index of a material depends on the frequency of the light used for the measurement
- (b) The speed of light in a medium depends on the refractive index of the medium
- (c) Critical angle of water is smaller for violet light compared to that for red light
- (d) In all material media yellow light travels with the same speed

- a
- b
- c
- d

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

13) STATEMENT-1  
The formula connecting u, v and f for a spherical mirror is valid only for mirrors whose sizes are very small compared to their radii of curvature because  
STATEMENT-2  
Laws of reflection are strictly valid for plane surfaces, but not for large spherical surfaces.

- (a) Statement-1 is True, Statement-2 is true; Statement-2 is a correct explanation for Statement-1
- (b) Statement-1 is True, Statement-2 is true; Statement-2 is NOT a correct explanation for Statement-1
- (c) Statement-1 is True, Statement-2 is false
- (d) Statement-1 is False, Statement-2 is true

- a
- b
- c
- d

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