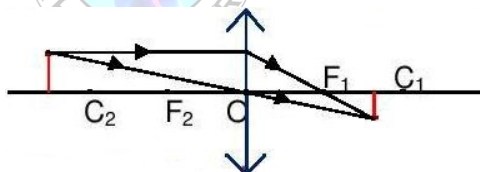


**06. REFRACTION AT CURVED SURFACES**

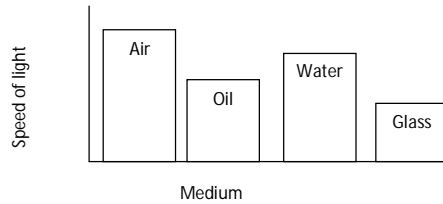
- The focal length of a converging lens is 20cm. An object is placed about 60cm from the lens.  
Where will be the image formed? What kind of image is it?
- A spherical mirror and a spherical lens have same focal length -15cm. What do you say about the type of mirror and lens?
- Half of a convex lens is covered with a black paper. Can it form full image?
- A lemon in water glass appears in big size. Draw a ray diagram to explain it.
- Select the convergent lenses from the following.
  - Bi convex lens
  - Bi concave lens
  - Plano convex lens
  - Plano concave lens
  - Convexo concave lens
- Classify the following as convergent and divergent lenses.
  - Bi convex lens
  - Bi concave lens
  - Plano convex lens
  - Plano concave lens
  - Convexo concave lens
- If object is placed beyond  $C_2$  on the principle axis of a convex lens, where should be the image collected? What are the properties of the image?

- Draw a line that indicates a lens such that it is suitable for the diagram. \_\_\_\_\_  
In the two dots, one represents the object and the other represents image.
- Interpret the following diagram.



- An object is placed at 20cm on the axis of a convex lens. The image can be collected at 40cm.  
Find the focal length and radius of curvature of the lens.
- Is the focal length of a bi convex lens is positive? How can you tell?
- Write the differences between convex lens and concave lens?
- Write the differences between concave mirror and convex lens?
- An optical device which is working on the principle of refraction, formed the virtual image of an object in small size.
  - Is it a mirror or lens?
  - What is the optical device?
  - What is the place of the object?
  - Where should be the image collected?
- If object is placed at  $2f$  distance of a convex lens, Where should be the image collected?  
Draw a ray diagram.

16. Speed of light in different material is given in the graph.



Which one among the given media has more refractive index value? How can you justify your answer?

17. If Jagruthi obtained a magnification of -1 with convex lens of focal length 10cm. What is the distance from the lens to the object?

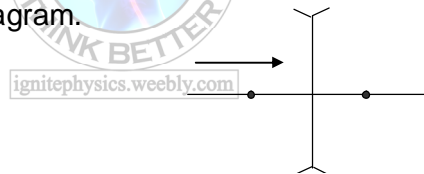
18. Which of the following statements are true for the refraction of light rays through curved surfaces?

- (i) The focal length of a converging lens is some times negative.
- (ii) The focal length of a converging lens is always negative.
- (iii) The focal length of a converging lens is always positive.

19. Define a lens. Name different lenses. Draw the diagrams.

20. Your friend have two lenses in his/her hand. They are bi convex lens and bi concave lens. But he/she could not distinguish them. He make a phone call to you and ask you to help him/her . How would you give proper guidance to identify the lenses?

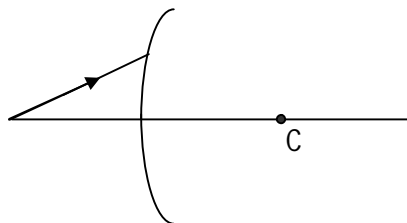
21. Complete the refracted ray in the diagram.



22. What is the focal length of a double concave lens kept in air with two spherical surfaces of radii  $R_1 = 30\text{cm}$  and  $R_2 = 60\text{cm}$ . Take refractive index of lens as  $n = 1.5$ .

23. Write the properties of convex lens.

24. Draw a normal to the curved surface at the point of incidence.



25. Can a virtual image be photographed by a camera? Give two examples in daily life to support your answer.

26. Draw a ray diagram for the formation of the image, if object is placed between centre of curvature and focus of the a Convex lens. Write the properties of the image.
27. How can you determine the focal length of a convex lens ?  
(Note : You were given only a thin convex lens.)
28. Write the Lens maker's formula. Explain the terms in it.
29. Interpret about the image in the following situations.  
(a) If Object is placed at 'C' of a convex lens  
(b) If object is placed at 'C' of a concave lens
30. Interpret about the image in the following situations.  
(a) If Object is placed at 'C' of a convex lens  
(b) If object is placed at 'C' of a concave mirror
31. Do the following lenses form virtual images. If yes, mention the situations.  
(a) Bi convex lens  
(b) Bi concave lens

