Answer on Question #42349, Physics, Optics

A certain camera has f-numbers that range from 1.3 to 5. If the focal length of the lens is 49 mm, what is the range of aperture diameters for the camera?

Solution:

In optics, the f-number (sometimes called focal ratio, f-ratio, f-stop, or relative aperture) of an optical system is the ratio of the lens's focal length to the diameter of the entrance pupil.

Thus,

$$f - \text{number} \ = \ \frac{\text{focal length}}{\text{aperture diameter}}$$

So,

$$\text{aperture diameter} \ = \ \frac{\text{focal length}}{f - \text{number}}$$

$$D_{min} = \frac{49}{5} = 9.8 \text{ mm}$$

$$D_{max} = \frac{49}{1.3} = 37.7 \text{ mm}$$

Answer.

Dmin = 9.8 mm;

Dmax = 37.7 mm.