

IMPORTANT QUESTIONS:

Q.1 Obtain the thin lens formula for the convex lens.

2012 Failure, 2008, 2007 failure (2002 P.M, 1998, 1996)

Q.2 Two thin convex lenses of focal length f_1 and f_2 are placed in contact. Derive the formula for the focal length of the combination.

2007 (2004, 2003 P.E, 1999, 1997)

Q.3 With the help of a ray diagram explain the working of a simple Microscope.
Derive the relation for its magnifying power

2007 (2004, 2003 P.E, 2003 P.M, 2002 P.E, 2000, 1998, 1995, 1993, 2006)

Q.4 With the help of a ray diagram derive an expression for the magnifying power of a compound microscope.

(2001, 1999, 1996, 1995, 1994, 2006, 2008)

Q.5 With the help of a neat ray-diagram describe the construction and working of a compound microscope. Derive the formula for its magnification.

(2009, 2011, 2013)

Q.6 Draw a labelled diagram showing the passage of light ray through an astronomical telescope focused for infinity and obtain an expression for its magnifying power.

(2012 Failure, 2010, 2005, 2002 P.M, 2000, 1998, 1996, 1992)

Q.7 What are the defects in lenses and how are they removed?

(2009, 2005, 2003 P.M, 2002 P.E, 2001, 1998, 1994, 1992)

Q.8 Why do thick lenses chromatic and spherical aberration? Suggest remedies for the rectification of these defects.

(2009)

Q.9 How can a magnifying glass be used as simple microscope. Derive the expression for its magnifying power. Write two differences between Astronomical and Galilean Telescope.

(2012)

DIFFERENCES:

Convex Lens	Concave Lens
1. This lens is thicker in the middle and thinner at the edges	1. This lens is thinner in the middle and thicker at the edges
2. This lens converges a parallel beam of light to a point.	2. This lens diverges a parallel beam of light.
3. It is also called a converging lens.	3. It is also called a diverging lens.

Real Image	Virtual Image
1. If the rays actually intersect after passing through the lens, the image will be real.	1. If the rays appear to intersect after passing through the lens, the image will be virtual.
2. Real image is always inverted.	2. Virtual image is always erect.
3. Real image can be projected on the screen.	3. Virtual image can not be projected on the screen.

Microscope	Telescope
1. It is used for seeing near very small objects.	1. It is used for seeing distant objects.
2. Focal length of the eye-piece is greater than the focal length of the objective.	2. Focal length of the objective is greater than the focal length of the eyepiece.
3. The aperture of the objective is small.	3. The aperture of the objective is large.
4. For higher magnification focal length of the object should be small	4. For higher magnification focal length of the objective should be large.

Astronomical Telescope	Galilean Telescope
1. In an astronomical telescope the eye piece is a convex lens.	1. In a Galilean telescope the eye piece is a concave lens.
2. The astronomical telescope forms an inverted image.	2. The Galilean telescope forms an erect image.
3. The length of astronomical telescope is. $L = f_o + f_e$	3. The length of Galilean telescope is. $L = f_o - f_e$

Astronomical Telescope	Terrestrial Telescope
1. It is an optical instrument which helps us to see distant object in space.	1. It is an optical instrument which helps us to distant object on the earth.
2. It consists of two convex lenses.	2. It consists three convex lenses.
3. The final image is inverted	3. The final image is erect.
4. The length of astronomical telescope is. $L = f_o + f_e$	4. The length of terrestrial telescope is $L = f_o + 4f_r + f_e$