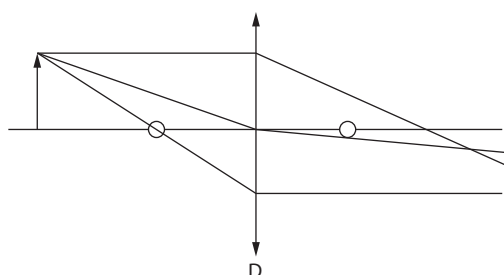
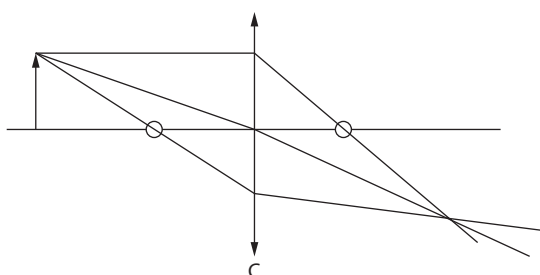
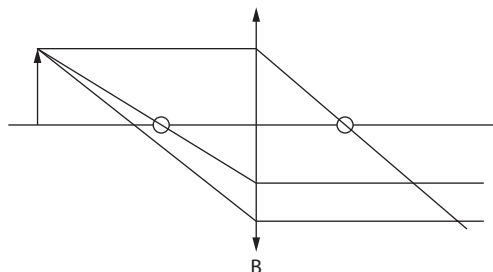
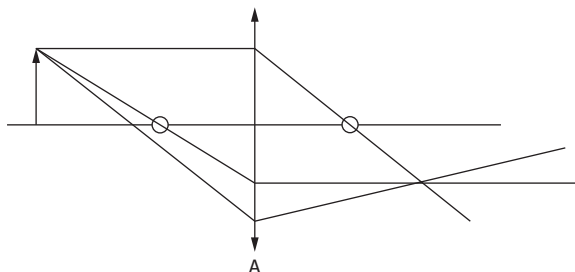


Self-test questions

Option C (SL)

1 Of the figures below, which is a correct ray diagram for a converging lens?



- A
- B
- C
- D

2 An object is placed at a distance of 30 cm in front of a converging lens of focal length 10 cm. What is the correct description of the image?

	Type of image	Distance
A	real	7.5 cm
B	real	15 cm
C	virtual	7.5 cm
D	virtual	15 cm

3 An object is placed at a distance of 4.0 cm in front of a converging (concave) mirror of focal length 12 cm. What is the correct description of the image?

	Type of image	Distance
A	real	3.0 cm
B	real	6.0 cm
C	virtual	3.0 cm
D	virtual	6.0 cm

4 Optical instrument defects include spherical and chromatic aberrations. Which list correctly identifies an instrument with an aberration?

	Spherical	Chromatic
A	lenses and mirrors	lenses and mirrors
B	lenses and mirrors	lenses
C	lenses	lenses and mirrors
D	lenses	lenses

- 5 Which list gives types of dispersion suffered by monomode and multimode optical fibres?

	Monomode	Multimode
A	material and waveguide	material and waveguide
B	material and waveguide	material
C	material	material and waveguide
D	waveguide	material

- 6 A digital signal of power 1200 mW is input into an optic fibre. After travelling a distance of 4.0 km in the fibre the power has been reduced to 12 mW. What is the power loss per km for this fibre?

- A 5.0 dB km⁻¹
 B 0.50 dB km⁻¹
 C 2.5 dB km⁻¹
 D 0.25 dB km⁻¹

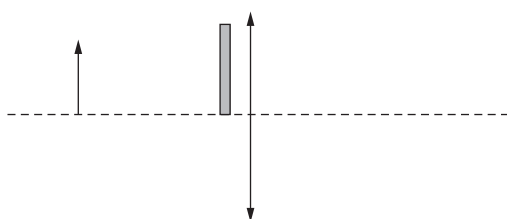
- 7 An array of radio telescopes consists of N identical parabolic antennas of diameter D . The antennas extend over a linear distance of L . Give an **estimate** of the smallest angular separation that can be resolved.

- A $\frac{\lambda}{D}$
 B $\frac{\lambda}{ND}$
 C $\frac{\lambda}{L}$
 D $\frac{\lambda}{NL}$

- 8 The final image in a refracting telescope is formed at infinity. The objective focal length is 60 cm and the eyepiece focal length is 4.0 cm. A distant object subtends an angle of 30 arcseconds at the unaided eye. What is the angle subtended at the eyepiece?

- A 2.0 arcseconds
 B 30 arcseconds
 C 450 arcseconds
 D 1800 arcseconds

- 9 An object is placed in front of a converging lens and real image is formed. The upper half of the lens is then covered with opaque piece of cardboard.



What, if anything, will happen to the image?

- A Nothing will happen.
 B The upper half of the image will not be formed.
 C The lower half of the image will not be formed.
 D The image will be less bright.

- 10 The angular magnification of a compound microscope is defined as the ratio of:
- A** the angle subtended by the image at the eyepiece to the angle subtended by the object at the unaided eye
 - B** the angle subtended by the image at the eyepiece to the angle subtended by the object at the unaided eye at a distance equal to that of the near point
 - C** the angle subtended by the image at the objective to the angle subtended by the object at the unaided eye
 - D** the angle subtended by the image at the objective to the angle subtended by the object at the unaided eye at a distance equal to that of the near point