

PART A: MULTIPLE CHOICE (10 MARKS)

Choose the best response in each case and place your answer in the appropriate space on your answer sheet.

- Which part of the eye is responsible for detecting light?
 - cornea
 - iris
 - lens
 - retina
- Which of the following is not true about a converging lens?
 - it can form both real and virtual images
 - it causes parallel light rays to converge
 - it can also be called a concave lens
 - it can be used as a magnifying lens
- A ray of light travels parallel to the principal axis of a diverging lens. After refraction, the ray passes (or appears to pass):
 - through F'
 - through F
 - through C
 - through O
- A converging lens has a focal length of 10 cm. Where should the object be placed so that the refracted rays are parallel and form no image?
 - 10 cm in front of the mirror
 - 15 cm in front of the mirror
 - 30 cm in front of the mirror
 - at an infinite distance
- An object is located outside the secondary focus ($2F'$) of a converging lens. Its image will be:
 - upright and smaller.
 - upside-down and smaller.
 - upright and larger.
 - upside-down and larger.
- Where must an object be placed with respect to a converging lens in order to obtain a virtual image?
 - at F'
 - at $2F'$
 - between F' and the lens
 - anywhere - a converging lens only produces virtual images
- As the distance of an object from a converging lens increases, the image:
 - increases in size and moves away from the lens.
 - increases in size and moves toward the lens.
 - decreases in size and moves away from the lens.
 - decreases in size and moves toward the lens.
- Which of these types of images is not possible with a diverging lens?
 - an image that is smaller than the object
 - an upside-down image
 - a virtual image
 - an image
- A magnifying lens produces:
 - a large, upright, virtual image.
 - a large, upright, real image.
 - a large, upside down, virtual image.
 - a small, upside down, real image.
- Which part of the eye is responsible for controlling the amount of light entering the eye?
 - cornea
 - iris
 - lens
 - retina

PART B: MATCH (5 MARKS)

Match the definition from the 1st column to the best term in the 2nd column and place the matching letter in the appropriate space on your answer sheet.

- | | |
|---|--------------------|
| 1. Type of lens that produces both real and virtual images. | A) accommodation |
| 2. Type of image that cannot be captured on paper. | B) cones |
| 3. Process eye uses to change the shape of its lens and hence its focal length. | C) converging lens |
| 4. Eye defect in which distant objects are not seen clearly (near-sightedness). | D) diverging lens |
| 5. Photoreceptors sensitive to colour. | E) hyperopia |
| | F) myopia |
| | G) real image |
| | H) rods |
| | I) virtual image |

PART A: MULTIPLE CHOICE (10 MARKS)

1	2	3	4	5	6	7	8	9	10
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PART B: MATCH (5 MARKS)

1	2	3	4	5
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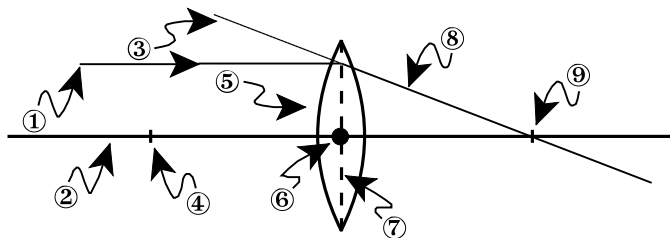
PART C: SHORT ANSWER (23 MARKS)

Answer the following questions in the space provided.

- {9} 1. (a) Match the labels below to the correct item in the diagram and then place the # in the space provided.
(b) Number and name the remaining items.

- (a) ___ convex lens ___ principal axis
 ___ principal focus ___ optical centre
 ___ refracted ray ___ virtual ray

- (b) _____



- {2} 2. What 2 assumptions are made to simplify the drawing of ray diagrams for thin lenses?

- ① _____
 ② _____

- {12} 3. Using ray diagrams (i) locate the images formed by the curved lenses and (ii) the type of image formed.

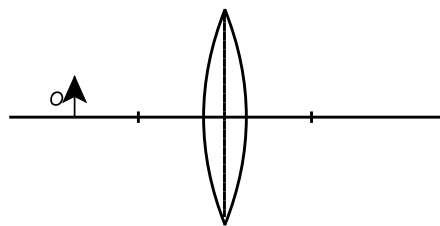


IMAGE:

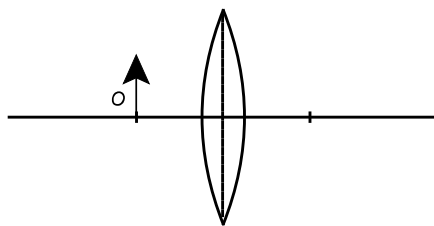


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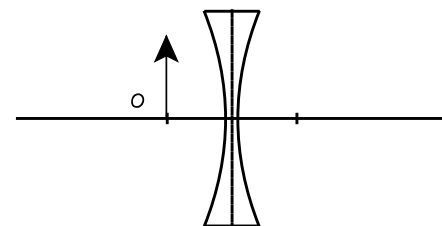


IMAGE:

PART D: PROBLEMS (25 MARKS)

Answer the following questions on a separate sheet of paper. You may use the back of this sheet if you wish.

- {8} 1. A candle +10 cm high is placed +20 cm in front of a converging lens of focal length +25 cm.
 (a) How far from the lens is the image?
 (b) What is the magnification of the lens?
 (c) What is the significance of the +ve answer to (b) - ie what does the +ve sign tell you about the image?
- {7} 2. A +5.0 cm tall toy soldier is placed +40 cm in front of a diverging lens of focal length -8.0 cm.
 (a) How far from the lens is the image?
 (b) What is the height of the image?
- {10} 3. (a) Explain why a boy with hyperopia might hold a book very far from his eyes while reading.
 (b) Draw a diagram showing why a myopic eye cannot produce clear images of distant objects.
 (c) What happens to a person's colour vision if one of the three types of cones in their eyes stops working?