



Attempt questions first; check the separate key afterward. Show all working. Draw accurate figures where required.

A. Very short answers - 1 mark each

1. State the law relating angles of incidence and reflection.
2. If incidence angle is 35° , find reflection angle.
3. A ray makes 20° with the mirror surface. Find incidence angle.
4. Find the angle between incident and reflected rays.
5. What kind of image does a plane mirror form?
6. Draw its ray diagram.
7. An object is 2 m in front of a plane mirror. Find image distance behind it.
8. Find object-image separation.

B. Short answers / practice - 2 marks each

9. Does a real image form on a screen?
10. Distinguish real and virtual images.
11. Which spherical mirror can give a wider field of view?
12. Explain its use in security or rear-view mirrors.
13. Which mirror can concentrate parallel sunlight near a focus?
14. Draw rays showing this, without looking at the Sun.
15. Which lens is thicker at the centre than at the edge?
16. Which lens is thinner at the centre?
17. Does a convex lens always form a real image?
18. Explain how a magnifying glass gives an enlarged upright image.
19. What is refraction?
20. Explain why a pencil appears bent at the water surface.

C. Application / reasoning - 3 marks each

21. A plane mirror moves 1 cm toward a fixed object. How much does object-image separation decrease?

22. Explain with a labelled sketch.

23. Name the phenomenon responsible for white light splitting into colours in a prism.

24. List the usual rainbow colours in order from red to violet.

25. Does diffuse reflection violate the laws of reflection?

26. Explain smooth-surface and rough-surface reflection.

27. An object stands 75 cm from a plane mirror. Find object-image separation.

28. A ray's reflection angle is 48° . Find its angle with the mirror surface.

29. Explain why printed letters can look reversed in a plane mirror.

30. Can a concave lens converge a parallel beam in air?

31. Sketch how a convex lens brings a parallel beam to a focus.

D. Extended practice - 5 marks per pair

32. Which simple device uses two plane mirrors to see over an obstacle?

33. Draw and explain a simple periscope.

34. Can light travel through vacuum?

35. Compare plane, concave and convex mirrors and convex/concave lenses with one use and a ray sketch for each.

ANSWER KEY - Numerical / closed questions

- 1) They are equal. 2) 35° . 3) 70° . 4) 140° . 5) Virtual, upright, same size, laterally inverted. 7) 2 m. 8) 4 m. 9) Yes. 11) Convex mirror. 13) Concave mirror. 15) Convex lens. 16) Concave lens. 17) No. 21) 2 cm. 23) Dispersion. 24) Red, orange, yellow, green, blue, indigo, violet. 25) No. 27) 150 cm. 28) 42° . 30) No; it diverges the beam. 32) Periscope. 34) Yes.