Step-by-Step Solutions & Marking Scheme

CBSE Class 8 Science (Curiosity) — Chapter 10: Light: Mirrors and Lenses

Quick answer key — Section A: 1-(b) 2-(a) 3-(c) 4-(c) 5-(a) 6-(b) 7-(A) 8-(C)

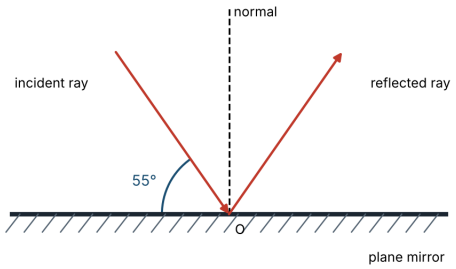
SECTION A — Multiple Choice Questions

1. (b) outwards

A convex mirror has its reflecting surface curved outwards (bulging towards the viewer); a concave mirror is curved inwards.

Marking: 1 mark.

2. Fig. 1 → **(a) 35°**



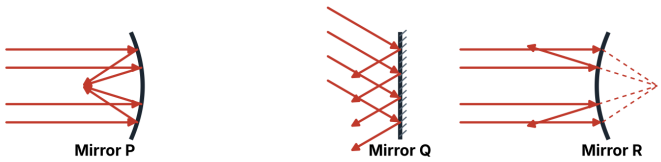
Step 1: The angles of incidence and reflection are measured from the normal, not from the mirror surface.

Step 2: Angle of incidence = 90° − 55° = 35°.

Step 3: By the law of reflection, angle of reflection = angle of incidence = **35°**.

Marking: 1 mark.

3. Fig. 2 → **(c) Mirror R**



Mirror P (concave) makes the parallel rays converge; Mirror Q (plane) keeps the beam parallel; Mirror R (convex) spreads the rays out, so it makes the beam diverge.

Marking: 1 mark.

4. (c) Concave lens

A concave lens always forms an erect and diminished image. A convex lens and a concave mirror can form inverted or enlarged images; a plane mirror gives an image of the same size.

Marking: 1 mark.

5. (a) a convex lens, which converges light

A convex lens is thicker in the middle and thinner at the edges; it bends parallel rays towards one another, so it is a converging lens.

Marking: 1 mark.

6. (b) concave

When an object is close to it, a concave mirror forms an erect and enlarged image; this is why dentists use it to examine teeth.

Marking: 1 mark.

7. Assertion–Reason → **(A)**

Step 1: A is true: convex mirrors are used as side-view mirrors.

Step 2: R is true: a convex mirror always forms an erect, diminished image and covers a wider field of view.

Step 3: The wider field of view is the reason these mirrors are chosen, so R explains A → (A).

Marking: 1 mark.

8. Assertion–Reason → **(C) A is true but R is false.**

Step 1: A is true: a convex lens converges sunlight to a bright point that can burn paper.

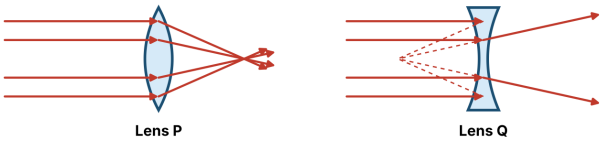
Step 2: R is false: a convex lens is **thicker** at the middle than at the edges.

Step 3: A true, R false → (C).

Marking: 1 mark.

SECTION B — Short Answer Questions

9. Lenses P and Q (Fig. 3)

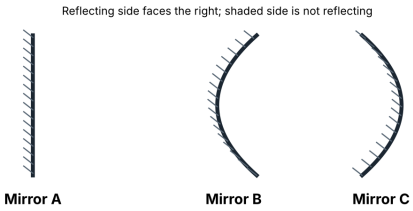


(a) Lens P makes the beam converge, so it is a **convex lens** (thicker in the middle). Lens Q makes the beam diverge, so it is a **concave lens** (thicker at the edges).

(b) The **convex lens P** is used as a magnifying glass.

Marking: 1 mark for each part.

10. Side views of mirrors (Fig. 4)



(a) A is a **plane mirror** (flat), B is a **concave mirror** (reflecting surface curved inwards) and C is a **convex mirror** (reflecting surface curved outwards).

(b) Mirror B (concave) is used as the reflector in a torch, since it sends the light from the bulb out as a strong beam.

Marking: 1 mark for each part.

11. Law of reflection

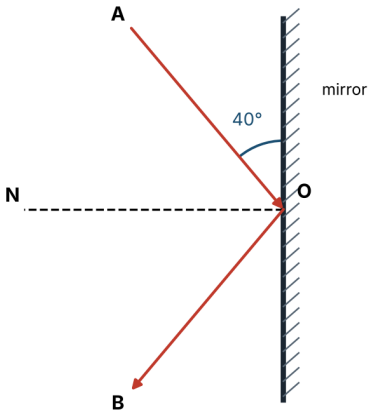
(a) The angle of incidence is equal to the angle of reflection (i = r). (The incident ray, the normal and the reflected ray also lie in the same plane.)

(b) A ray along the normal has angle of incidence 0°, so the angle of reflection is also **0°**; it returns along the same path.

Marking: (a) 1; (b) 1.

SECTION C — Long Answer Questions

12. Reflection at a plane mirror (Fig. 5)



(i) The normal is at 90° to the mirror, so angle of incidence = 90° − 40° = **50°**.

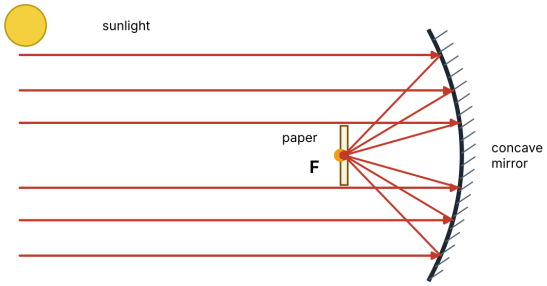
(ii) Angle of reflection = angle of incidence = **50°**.

(iii) Angle AOB = 50° + 50° = **100°**.

(iv) The reflected ray makes 90° − 50° = **40°** with the mirror.

Marking: 1 mark for each part.

13. Sunlight on a concave mirror (Fig. 6)



(i) A **concave mirror**.

(ii) The mirror makes the parallel rays of sunlight converge at one point F; the light energy gets concentrated there, heating the paper until it burns.

(iii) A **convex lens**.

(iv) A convex mirror would make the reflected rays **diverge** (spread out), so no bright spot would form and the paper would not burn.

Marking: 1 mark for each part.

14. Images in mirrors

(i) Object close to a concave mirror: the image is **erect and enlarged**.

(ii) Object far from a concave mirror: the image is **inverted**.

(iii) A convex mirror always forms an **erect and diminished** image.

(iv) Concave mirror: reflector in a torch or headlight / dentist's mirror / telescope. Convex mirror: side-view mirror of vehicles / road-safety or surveillance mirror (any one each).

Marking: 1 mark for each part.

15. Reasons

(i) A convex mirror gives an erect, diminished image and a wider field of view, so the driver can see more of the traffic behind.

(ii) A concave mirror reflects the light from the bulb as a strong beam that travels ahead, lighting up the road.

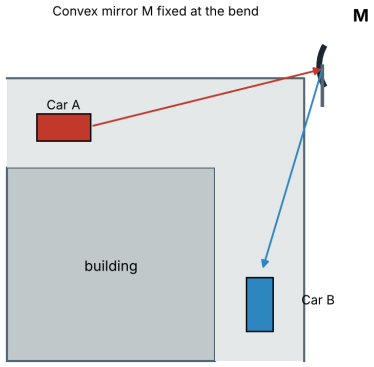
(iii) A drop of water is thicker in the middle, so it acts like a convex lens (magnifying glass) and enlarges the letters.

(iv) A mirror shows lateral inversion; the word reads correctly in the rear-view mirror of the vehicle ahead, so the driver can read it and give way.

Marking: 1 mark for each part.

SECTION D — Case-Based / Practical Questions

16. Mirror at a road bend (Fig. 7)



(i) M is a **convex mirror**.

(ii) It has a **wider field of view** than a plane mirror, so the driver sees a larger part of the road.

(iii) The image is **erect and diminished** (smaller than the car).

(iv) No: a plane mirror has a narrower field of view, so it would show much less of the road bend.

(v) Side-view mirrors of vehicles, or surveillance mirrors in shops (any one).

Marking: 1 mark for each part.

17. Spoon and lens

(i) The **inner (hollow, curved inwards) side**.

(ii) A **convex mirror** (its reflecting surface is curved outwards).

(iii) A concave mirror forms an inverted image when the object is far from it.

(iv) The image is **erect and enlarged**.

(v) A concave lens is a diverging lens: it spreads the parallel rays out instead of bringing them together at a point.

Marking: 1 mark for each part.

Section	A	B	C	D	Total
Marks	8	6	16	10	40

Note: any other correct and relevant answer should be accepted and awarded full marks.