Step-by-Step Solutions & Marking Scheme

CBSE Class 8 Science (Curiosity) — Chapter 11: Keeping Time with the Skies

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

SECTION A — Multiple Choice Questions

1. (b) new Moon day (Amavasya)

On the new Moon day only the non-illuminated half of the Moon faces the Earth, so we cannot see the Moon.

Marking: 1 mark.

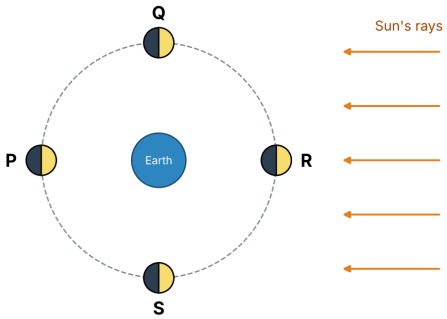
2. Fig. 1 → **(b) Q**



The gibbous phase is when more than half of the illuminated portion is seen. P shows a half, R a crescent (less than half), S a full circle (full Moon) and Q more than half: **gibbous**.

Marking: 1 mark.

3. Fig. 2 → **(c) R**



On the new Moon day the Moon lies between the Earth and the Sun, so its non-illuminated side faces the Earth. That is position R (position P, opposite the Sun, is the full Moon).

Marking: 1 mark.

4. (c) 354 days

12 lunar months × about 29.5 days = 354 days, which is about 11 days shorter than the solar year.

Marking: 1 mark.

5. (d) 2024

A year divisible by 4 is a leap year; century years like 1900 and 2100 are skipped (only those divisible by 400 are leap years). 2026 is not divisible by 4; 2024 is.

Marking: 1 mark.

6. (b) 50 minutes

The Moon moves ahead in its orbit while the Earth rotates once, so the Earth must rotate a little more; moonrise gets later by about 50 minutes each day.

Marking: 1 mark.

7. Assertion–Reason → **(A)**

Step 1: A is true: eclipses do not occur every month.

Step 2: R is true: the Moon's orbit is slightly tilted to the Earth's orbit around the Sun.

Step 3: Because of the tilt, the Sun, Earth and Moon do not line up every month, so R explains A → (A).

Marking: 1 mark.

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

Step 1: A is false: the Moon has no light of its own.

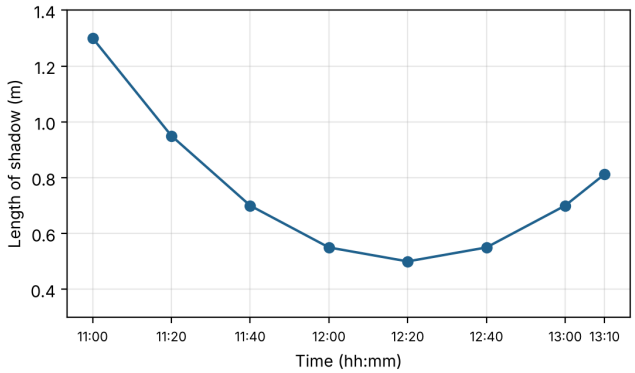
Step 2: R is true: it shines by reflecting sunlight.

Step 3: The shape seems to change because we see different amounts of its illuminated part. A false, R true → (D).

Marking: 1 mark.

SECTION B — Short Answer Questions

9. Shadow of a stick (Fig. 3)

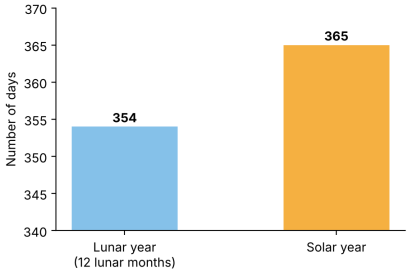


(a) The shadow is shortest at **12:20** (the lowest point of the graph).

(b) At that time the Sun is at its **highest position** in the sky. Noting this time on two consecutive days and finding the difference gives the length of the solar day, which is about **24 hours**.

Marking: 1 mark for each part.

10. Lunar and solar year (Fig. 4)



(a) 365 − 354 = **11 days**.

(b) The extra month is the **Adhika Maasa** (intercalary month).

Marking: 1 mark for each part.

11. Phases of the Moon

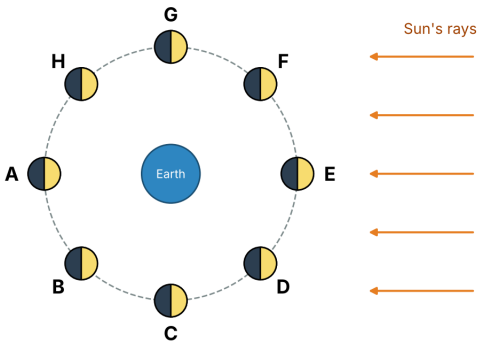
(a) The changing shapes of the bright (illuminated) portion of the Moon, as seen from the Earth from one day to another, are called the phases of the Moon.

(b) It is called the **waxing** period; in India it is the **Shukla Paksha**.

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

SECTION C — Long Answer Questions

12. Moon in its orbit (Fig. 5)



(i) A, the position opposite to the Sun, where the whole illuminated half faces the Earth.

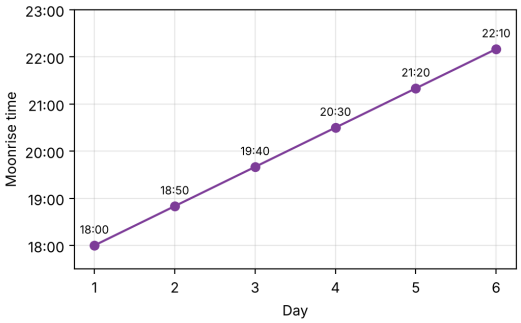
(ii) E, the position between the Earth and the Sun.

(iii) D and F (less than half of the illuminated portion can be seen).

(iv) Waxing (from E to G and back to A the bright part increases).

Marking: 1 mark for each part.

13. Moonrise times (Fig. 6)



(i) About **50 minutes** (e.g. 18:00 to 18:50).

(ii) 22:10 + 0:50 = **23:00** (about 11 p.m.).

(iii) The Moon moves ahead in its orbit while the Earth rotates once in 24 hours, so the Earth must rotate a little more for the Moon to reach the same position.

(iv) No; the Moon rises at different times than the Sun (about 50 minutes later each day) and may even rise in the afternoon.

Marking: 1 mark for each part.

14. Leap year

(i) The Earth takes about a quarter day more than 365 days to go round the Sun; these hours add up to about one day in four years, so a leap day keeps the calendar in step with the seasons.

(ii) 2000 and 2024 (1700 and 2100 are century years not divisible by 400).

(iii) 29 days, since 2024 is divisible by 4.

(iv) A **solar calendar** (based on the cycle of seasons).

Marking: 1 mark for each part.

15. Reasons

(i) The Moon is a sphere lit by the Sun; as it revolves around the Earth we see different fractions of its illuminated half.

(ii) Eid-ul-Fitr follows a purely lunar calendar (354 days a year, no intercalary month), so it moves about 11 days earlier each Gregorian year.

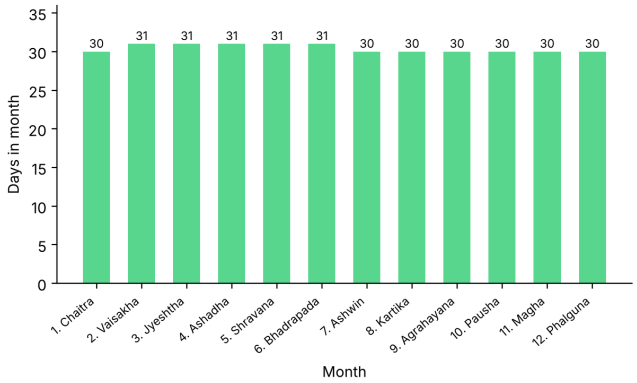
(iii) The Moon's orbit is slightly tilted to the Earth's orbit around the Sun, so the three bodies do not line up every month.

(iv) The Earth rotates once a day, which is much shorter than the Moon's revolution of about a month, so on a given day people everywhere see nearly the same phase.

Marking: 1 mark for each part.

SECTION D — Case-Based / Practical Questions

16. Indian National Calendar (Fig. 7)



(i) Months 2 to 6: **Vaisakha, Jyeshtha, Ashadha, Shravana and Bhadrapada**.

(ii) 30 + (5 × 31) + (6 × 30) = 30 + 155 + 180 = **365 days**.

(iii) Chaitra, the first month.

(iv) 22 March (21 March in a leap year).

(v) A **solar calendar**.

Marking: 1 mark for each part.

17. Festivals and satellites

(i) Lunar or luni-solar calendars (they are tied to the phases of the Moon).

(ii) A purely lunar calendar has no correction for the 11-day gap with the solar year, so Eid moves through the seasons; luni-solar calendars add an intercalary month every 2–3 years, so the shift stays within about a month.

(iii) Makar Sankranti follows a solar (sidereal) calendar, so it stays close to the same date of the Gregorian calendar, which is based on the tropical year.

(iv) 24 h = 1440 min; 1440 ÷ 100 = about **14 orbits** (14.4).

(v) Any two: communication, navigation, weather monitoring, disaster management, scientific research / mapping.

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.