

NCERT QUESTION WITH SOLUTIONS

1. State whether the following statements are True or False.

- (i) We can only see that part of the Moon which reflects sunlight towards us.
- (ii) The shadow of Earth blocks sunlight from reaching the Moon, causing phases.
- (iii) Calendars are based on various astronomical cycles which repeat predictably.
- (iv) The Moon can only be seen at night.

Solution

- (i) True: We can only see the part of the Moon that reflects sunlight towards Earth.
- (ii) False: The Earth's shadow causes lunar eclipses, not the regular phases of the Moon.
- (iii) True: Calendars are based on repeating astronomical events like day-night, Moon phases, and seasons.
- (iv) False: The Moon can also be seen during the daytime, depending on its phase and position in the sky.

2. Amol was born on 6th of May on a full Moon day. Does his birthday fall on the full Moon day every year? Explain your answer.

Solution

No, Amol's birthday does not fall on a full Moon Day every year. This is because the Moon's phases follow a lunar cycle of about 29.5 days, while the calendar year follows the solar cycle of about 365 days. So, the date of the full Moon changes each year in the Gregorian calendar.

3. Name two things that are incorrect in the Figure.



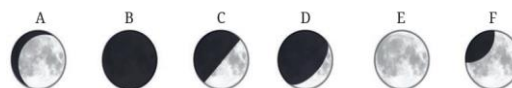
Solution

Two incorrect things are:

Stars are shown near the Moon during the daytime, which is incorrect because stars are not visible in the daytime sky.

The Moon's dark part is shaded incorrectly to show a phase. The shadow in the figure suggests it's caused by Earth's shadow, which is not true for regular Moon phases; they are caused by the Moon's position relative to the Earth and Sun, not a shadow.

4. Look at the pictures of the Moon in the figure and answer the following questions.

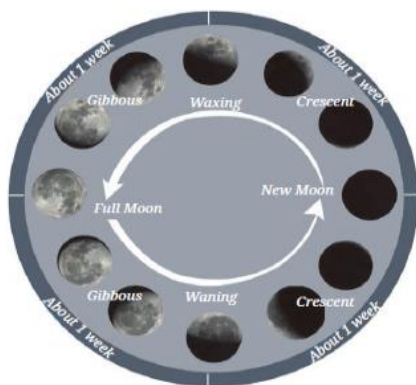


- (i) Write the correct panel number corresponding to the phases of the Moon shown in the pictures above.

Picture Label (e.g. A,B,C, etc.)	Phases of Moon
	Three days after New Moon
	Full Moon
	Three days after the Full Moon
	A week after the Full Moon

- (ii) List the picture labels of the phases of the Moon that are never seen from Earth.

Solution



Waxing (Shukla paksha) and waning period (Krishna paksha) of the Moon as viewed from the Earth

(i)

Picture B – On a new Moon day, only the non-illuminated side of the Moon faces the Earth, so it is not visible from Earth.

Picture F – This is not a phase of the Moon. So, it can never be seen from Earth.

5. Malini saw the Moon overhead in the sky at sunset.

(i) Draw the phase of the Moon that Malini saw.

(ii) Is the Moon in the waxing or the waning phase?

Solution

- (i) At sunset, the Moon is overhead only during the first quarter (a week after New Moon), when the right half is illuminated. So, we need to draw a half Moon (right half bright, left half dark)



- (ii) The Moon is in the waxing phase because at sunset a half Moon (first quarter) is seen overhead, and this happens only when the bright part of the Moon is increasing.

6. Ravi said, "I saw a crescent Moon, and it was rising in the East when the Sun was setting." Kaushalya said, "Once I saw the gibbous Moon during the afternoon in the East." Who out of the two is telling the truth?

Solution

Kaushalya is telling the truth because gibbous Moons can be seen in the East during the afternoon. Ravi's statement is incorrect because Crescent Moons do not rise in the East at sunset. A crescent Moon appears just after the New Moon (waxing crescent) or just before the New Moon (waning crescent). Waxing crescent is visible after sunset in the western sky, not rising in the east, and waning crescent rises just before sunrise, not at sunset.

7. Scientific studies show that the Moon is getting farther away from the Earth and slower in its revolution. Will luni-solar calendars need an intercalary month more often or less often?

Solution

Luni-solar calendars will need an intercalary month more often as the Moon moves farther and slower, and it takes longer to complete a cycle. So, a lunar year becomes even shorter compared to the solar year.

8. A total of 37 full Moons happen during 3 years in a solar calendar. Show that at least two of the 37 full moons must happen during the same month of the solar calendar.

Solution

Yes, at least two full Moons must happen in the same solar month.

A solar calendar has $12 \text{ months} \times 3 \text{ years} = 36 \text{ months}$.

37 full Moons in 36 months, at least one month must have 2 full Moons.

9. On a particular night, Vaishali saw the Moon in the sky from sunset to sunrise. What phase of the Moon would she have noticed?

Solution

As the Moon is visible all night long only on a Full Moon, it is a Full Moon.

10. If we stopped having leap years, in approximately how many years would the Indian Independence Day happen in winter?

Solution

One leap year adds ~ 1 day every 4 years. Without leap years, the calendar shifts by 1 day every 4 years.

There are roughly 183 days between 15 August (monsoon) and winter (mid-February).

$$183 \text{ days} \times 4 = 732 \text{ years}$$

In approximately 730-732 years, 15 August would occur in winter.

11. What is the purpose of launching artificial satellites?

Solution

Artificial satellites are launched for:

- Communication
- Navigation
- Weather monitoring
- Scientific research
- Disaster management
- Earth observation

12. On which periodic phenomenon are the following measures of time based:

- (i) day
- (ii) month
- (iii) year?

Solution

- (i) Day $\rightarrow$ Earth's rotation
- (ii) Month $\rightarrow$ Moon's revolution (phases of the Moon)
- (iii) Year $\rightarrow$ Earth's revolution around the Sun.