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| <b>Class: VIII</b>      | <b>DEPARTMENT: SCIENCE<br/>2025-26</b>        | <b>DATE: 17-01-2026</b>         |
| <b>WORKSHEET NO: 11</b> | <b>TOPIC: KEEPING TIME WITH THE<br/>SKIES</b> | <b>NOTE: A4 FILE<br/>FORMAT</b> |
| <b>CLASS &amp; SEC:</b> | <b>NAME OF THE STUDENT:</b>                   | <b>ROLL NO.</b>                 |

### **I. OBJECTIVE-TYPE QUESTIONS**

1. The phases of the Moon occur because:

- (a) The Moon produces its own light.
- (b) Earth's shadow falls on the Moon.
- (c) We see different portions of the Moon's illuminated side as it revolves around Earth.
- (d) The Sun changes its brightness

2. On a full Moon Day, the Moon is:

- (a) Near the Sun in the sky.
- (b) Opposite the Sun in the sky.
- (c) Overhead at noon
- (d) Invisible

3. The cycle of Moon phases from one full Moon to the next takes approximately:

- (a) 7 days
- (b) 15 days
- (c) 29.5 days
- (d) 365 days

4. The Indian National Calendar is based on:

- (a) Lunar cycles only
- (b) Solar year (tropical year)
- (c) Sidereal year
- (d) Phases of the Moon

5. Luni-solar calendars include:

- (a) Only Moon's phases.
- (b) Only Sun's position.
- (c) Moon's phases with adjustments to align with the solar year.
- (d) Random days

6. Which festival is based on the solar sidereal calendar?

- (a) Diwali
- (b) Eid-ul-Fitr
- (c) Makar Sankranti
- (d) Holi

7. Artificial satellites orbiting Earth are mainly used for:

- (a) Entertainment.
- (b) Communication.
- (c) Producing Moon phases.
- (d) Causing eclipses.

*For question numbers 8-10, two statements are given- one labelled Assertion (A) and the other labelled Reason (R). Select the correct answer to these questions from the codes (i), (ii), (iii) and (iv) as given below -*

- (i) Both A and R are true, and R is the correct explanation of the assertion.
- (ii) Both A and R are true, but R is not the correct explanation of the assertion.
- (iii) A is true but R is false.
- (iv) A is false but R is true.

8. **Assertion (A):** The Moon is sometimes visible in the daytime.

**Reason (R):** Moonrise occurs about 50 minutes later each day.

9. **Assertion (A):** Lunar eclipses happen every month.

**Reason (R):** The Moon takes about 29.5 days to complete one cycle of phases.

10. **Assertion (A):** Festivals like Diwali and Eid-ul-Fitr fall on the same dates each year.

**Reason (R):** They are based on the lunar or luni-solar calendar.

## **II. VERY SHORT ANSWER TYPE QUESTIONS (2M):**

1. Name the two periods of the Moon's phase cycle and their Indian names.

**[Hint: Waxing period (Shukla Paksha) and Waning period (Krishna Paksha).]**

2. What is the purpose of intercalary months in luni-solar calendars?

**[Hint: To align the lunar months with the solar year and seasons.]**

3. a) Define a solar day.
- b) Why don't lunar and solar eclipses occur every month, even though lunar eclipses happen on full Moon days and solar eclipses on new Moon days?

**[Hint: a) The average time the Sun takes to return to its highest position in the sky is about 24 hours.**

**b) They do not occur every month because the Moon's orbit is slightly tilted with respect to the Earth's orbit around the Sun.]**

4. a) Give one reason why the Moon appears different on different days.

b) How does the position of the Moon in the sky change when observed at the same time on successive days, and how can knowing the Moon's phase help us predict its visibility?

**[Hint: Because we see varying portions of the Moon's illuminated half as it revolves around Earth.**

**b) The Moon appears in a different part of the sky at the same time on successive days because it moves in its orbit around the Earth. On a full Moon Day, it is nearly opposite the Sun, so at sunrise, the Moon is almost setting in the west. As the Moon wanes, it appears closer to the Sun each morning. Knowing the phase of the Moon and whether it is waxing or waning helps us predict where and when to look for it: a waxing Moon is easiest to see at sunset, and a waning Moon is easiest to see at sunrise. Because of these shifts, the Moon rises and sets at different times than the Sun.]**

5. a) Name two types of calendars based on natural astronomical cycles.

b) List two ways artificial satellites are useful to us on Earth.

**[Hint: a) Lunar calendar, Solar calendar (also Luni-solar calendar).**

**b) Artificial satellites help us by monitoring weather patterns and providing communication signals for TV, phones, and navigation.]**

### **III. SHORT ANSWER TYPE QUESTIONS (3M):**

1. a) Explain why the Moon rises about 50 minutes later each day.

b) What is meant by the crescent phase and the gibbous phase of the Moon?

**[Hint: a) As the Earth rotates, the Moon also moves forward in its orbit around the Earth. Due to this movement, the Earth needs to rotate a little extra (approximately 50 minutes) to bring the Moon back to the same position in the sky. Hence, the Moon rises about 50 minutes later each day.**

**b) When more than half of the Moon's illuminated portion is visible, it is called the gibbous phase.**

**When less than half of the illuminated portion is visible, it is called the crescent phase.]**

2. a) Why does the crescent Moon always point towards the Sun?

b) Define the waning and waxing periods of the moon

[Hint: a) Because the illuminated portion of the Moon faces the Sun, the crescent always forms along the line joining the Sun and Moon.

b) Waning period is the time during which the visible illuminated portion of the Moon gradually decreases, changing from a full Moon to a new Moon. During this period, the Moon appears to shrink each night because a smaller part of its sunlit side is visible from Earth. The waxing period is the time during which the visible illuminated portion of the Moon gradually increases, changing from a new Moon to a full Moon. During this period, the Moon appears to grow brighter each night as more of its sunlit side becomes visible from Earth.]

3. How does the Gregorian calendar account for the extra 0.25 day in Earth's revolution around the Sun?

[Hint: By adding a leap day every four years. Skipping leap years in centuries not divisible by 400 keeps the calendar synchronised with seasons.]

4. a) Describe the difference between the tropical year and the sidereal year.

b) Describe how ancient people used the sky to create calendars.

[Hint: a) Tropical year is the time between successive spring equinoxes (~365.24 days); sidereal year is the time taken for Earth to complete one orbit relative to fixed stars (~365.256 days).

b) Ancient people observed the cycles of the Sun and Moon to create calendars. They noticed the regular changes in the Moon's shape for months and the repeating seasons for years.]

5. a) What is the significance of Uttarayan and Dakshinayan in tracking the Sun's path?

b) The phases of the Moon depend on the relative positions of which celestial bodies? Explain.

[Hint: a) They describe the apparent northward (Uttarayan) and southward (Dakshinayan) movement of the Sun, helping track solstices and seasons.

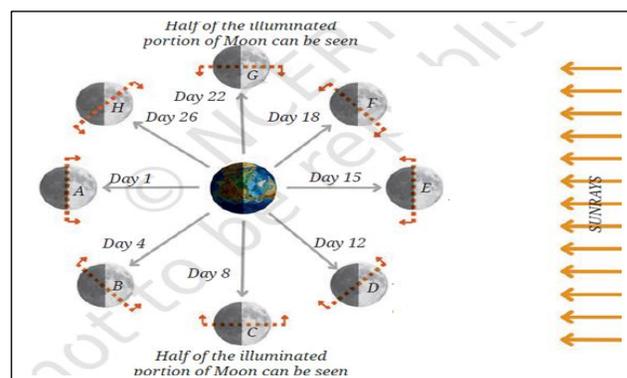
b) The phases of the Moon depend on the Sun, Moon, and Earth. As the Moon revolves around the Earth, the portion of its sunlit side visible from Earth changes. This causes the different phases of the Moon.]

#### IV. LONG ANSWER TYPE QUESTIONS (5M):

1. a) Explain how festivals in India are related to astronomical phenomena. Include examples of lunar, solar, and luni-solar calendar festivals.

b) Identify the portions labelled as Gibbous phase, crescent phase, full moon and new moon

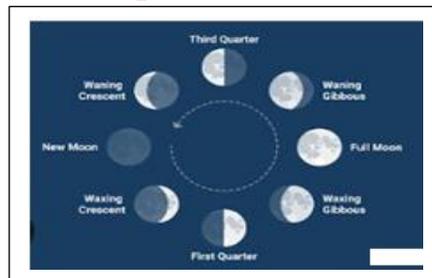
c) Draw a diagram showing the corresponding phases of the Moon as seen from the Earth.



[Hint: Many Indian festivals are based on Moon phases or the Sun's position. Lunar calendar festivals (e.g., Eid-ul-Fitr) depend on Moon phases and the shift in the Gregorian calendar. Luni-solar calendar festivals (e.g., Diwali) adjust lunar months with intercalary months to match the solar year. Solar sidereal festivals (e.g., Makar Sankranti) depend on the Sun's position, occurring on nearly the same date annually. Astronomical calculations (like Rashtriya Panchang) help predict exact dates.

b) Gibbous phase B and H, crescent phase – D and F, full moon-A and New moon-E]

c)



2. Describe the differences between lunar, solar, and luni-solar calendars. Give examples of each from the Indian context and explain how they stay in sync (or not) with the seasons.

[Hint: Lunar calendars are based on the Moon's phases, with months of about 29.5 days. Examples include the Islamic calendar. Solar calendars follow the Earth's revolution around the Sun, like the Gregorian calendar, which has months adjusted to fit 365 days. Luni-solar calendars, such as the Hindu calendar, count months by the Moon's phases but add an extra month every few years to keep up with the solar year and the seasons. Lunar calendars drift out of sync with seasons, solar calendars stay aligned, and luni-solar calendars use adjustments to match both cycles.]

#### **V. CASE STUDY- BASED QUESTIONS/PASSAGE-BASED QUESTIONS:**

1. Ravi noticed the Moon overhead at sunset, while Meera saw the crescent Moon in the afternoon. They were curious about why Moon phases change and why some festivals like Diwali do not fall on the same Gregorian date each year. They decided to observe the Moon and record its phases for a month, noting its position in the sky each day.

- (i) Which phase of the Moon was Ravi observing?
- (ii) Why does Diwali fall on different Gregorian dates each year?
- (iii) What would Ravi and Meera learn by recording Moon's position each day?

[Hint: (i) Waxing gibbous or full Moon (visible at sunset overhead).

(ii) Because it is based on a luni-solar calendar, which adjusts lunar months to match the solar year.

**(iii) They would understand the phases of the Moon, its movement across the sky, and the 29.5-day lunar cycle.]**

**ANSWERS FOR OBJECTIVE TYPE QUESTIONS 1 - 10**

- 1. (c) We see different portions of the Moon's illuminated side as it revolves around Earth.**
- 2. (b) Opposite the Sun in the sky**
- 3. (c) 29.5 days**
- 4. -(b) Solar year (tropical year)**
- 5. (c) Moon's phases with adjustments to align with the solar year**
- 6. (c) Makar Sankranti**
- 7. (b) Communication**
- 8. (i) Both A and R are true, and R is the correct explanation of the assertion.**
- 9. (iv) A is false but R is true.**
- 10. (iv) A is false but R is true.**

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