



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

A. Very short answers - 1 mark each

1. Which motion of Earth causes day and night?
2. Which motion is associated with the year?
3. About how long is one solar day?
4. About how long is one year?
5. Does the Moon produce its own visible light?
6. Explain why the Moon appears bright.
7. What causes the Moon's phases?
8. Explain why ordinary lunar phases are not Earth's shadow on the Moon.

B. Short answers / practice - 2 marks each

9. About how long is the new-Moon to new-Moon cycle?
10. Approximately how many such cycles occur in a year?
11. Which alignment produces a solar eclipse?
12. Which produces a lunar eclipse?
13. Does a solar eclipse occur at every new Moon?
14. Explain the importance of the Moon's tilted orbit.
15. What mainly causes Earth's seasons?
16. Explain why seasons are not mainly caused by changing Sun-Earth distance.
17. In which general direction does the Sun appear to rise?
18. Explain apparent daily motion using Earth's rotation.
19. A shadow stick casts changing shadows during a day. What can it help indicate?
20. Explain why a sundial is not useful in darkness or thick cloud.

C. Application / reasoning - 3 marks each

21. Earth turns 360° in 24 h. Find average angle turned per hour.

22. Find time corresponding to 30° of rotation.
 23. How many days are in a leap year?
 24. Explain why leap-day adjustments are needed in a solar calendar.
 25. Which star is used to estimate north in the Northern Hemisphere?
 26. Explain why most stars appear to move around it.
 27. Earth rotates through 45° in approximately how many hours?
 28. Explain why noon shadow length can change with season at one location.
 29. Is a lunar eclipse possible at the new-Moon phase?
 30. Twelve lunar cycles of 29.5 days total how many days? Compare with 365 days.
 31. Describe a month-long Moon-observation record using date, time, shape and sky position.
- ### D. Extended practice - 5 marks per pair
32. Is it safe to look directly at the Sun through ordinary sunglasses?
 33. Describe safe indirect observation of the Sun's image using a pinhole projection.
 34. Are equinox day and night lengths approximately equal?
 35. Draw the Sun-Earth system at solstices and equinoxes and explain seasonal changes in daylight.

ANSWER KEY - Numerical / closed questions

- 1) Rotation. 2) Revolution around the Sun. 3) 24 hours. 4) $365\frac{1}{4}$ days. 5) No; it reflects sunlight. 7) Changing view of its sunlit half. 9) 29.5 days. 10) 12.4. 11) Sun-Moon-Earth. 12) Sun-Earth-Moon. 13) No. 15) Axial tilt together with revolution. 17) East. 19) Time and direction. 21) 15° . 22) 2 h. 23) 366. 25) Polaris/Pole Star. 27) 3 h. 29) No; it requires full-Moon alignment. 30) 354 days; 11 days shorter. 32) No. 34) Yes.