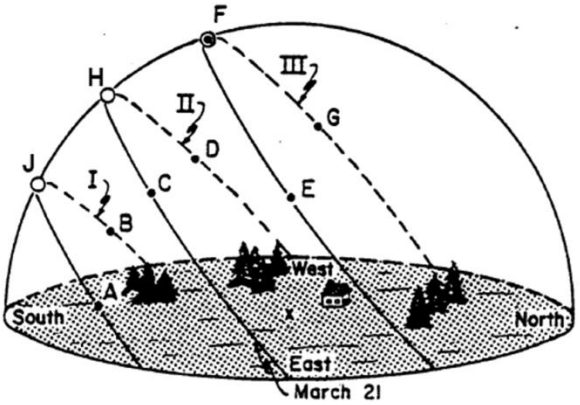
CELESTIAL SPHERE PRACTICE QUESTIONS

(Some questions have been extracted from Earth Motions Review Packets 1-6, while others are special and can only be found here!)

Base your answers to questions 1-3 on the diagram below. The diagram represents the apparent path of the Sun at three different dates during the year as it appears to an observer in New York State. The paths are labeled I, II, III and letters A through G are points on the paths. Path II occurs on March 21.



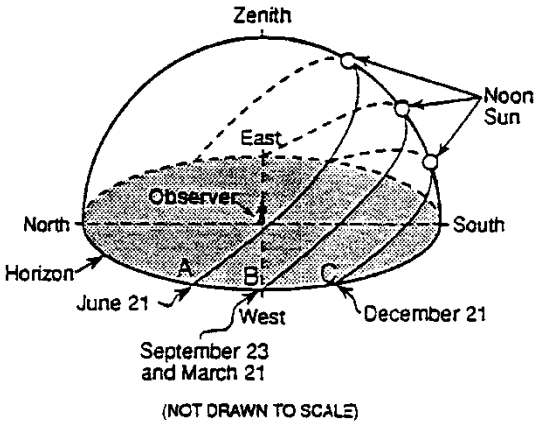
1. Which statement explains the apparent daily motion of the Sun across the sky along path II?
   (1) The Earth rotates on its axis.
   (2) The Earth revolves around the Sun.
   (3) The Earth's axis is inclined to its orbit.
   (4) The Earth's orbit is elliptical.

2. The angular distance along path II between points C and D is measured to be 90°. Approximately how much time would be required for the Sun to move this distance?
   (1) 1 hour
   (2) 2 hours
   (3) 6 hours
   (4) 4 hours

3. What is the azimuth of sunrise on March 21?
   (1) south
   (2) southeast
   (3) northeast
   (4) due east

Base your answers to questions 4 and 5 on the diagram below which represents the apparent daily path of the Sun across the sky in the Northern Hemisphere on the dates indicated.

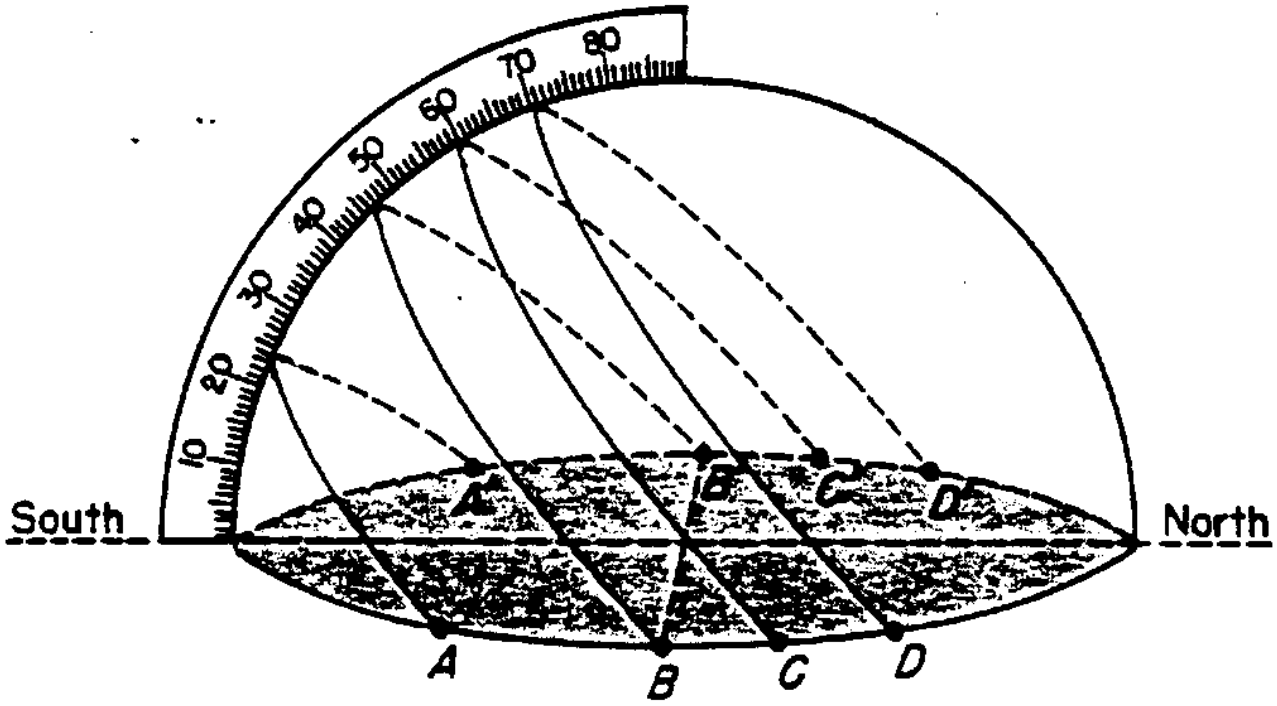
4. At noon on which date would the observer cast the longest shadow?
   (1) June 21
   (2) March 21
   (3) September 23
   (4) December 21



(NOT DRAWN TO SCALE)

5. What is the approximate altitude of the Sun at noon on September 23rd?
   1 20°
   2 48°
   3 75°
   4 90°

Base your answers to questions 6-9 on the diagram below. The diagram represents a plastic hemisphere upon which lines have been drawn to show the apparent paths of the Sun on four days at a location in New York State. Two of the days are December 21 and June 21. The protractor is placed over the north-south line.



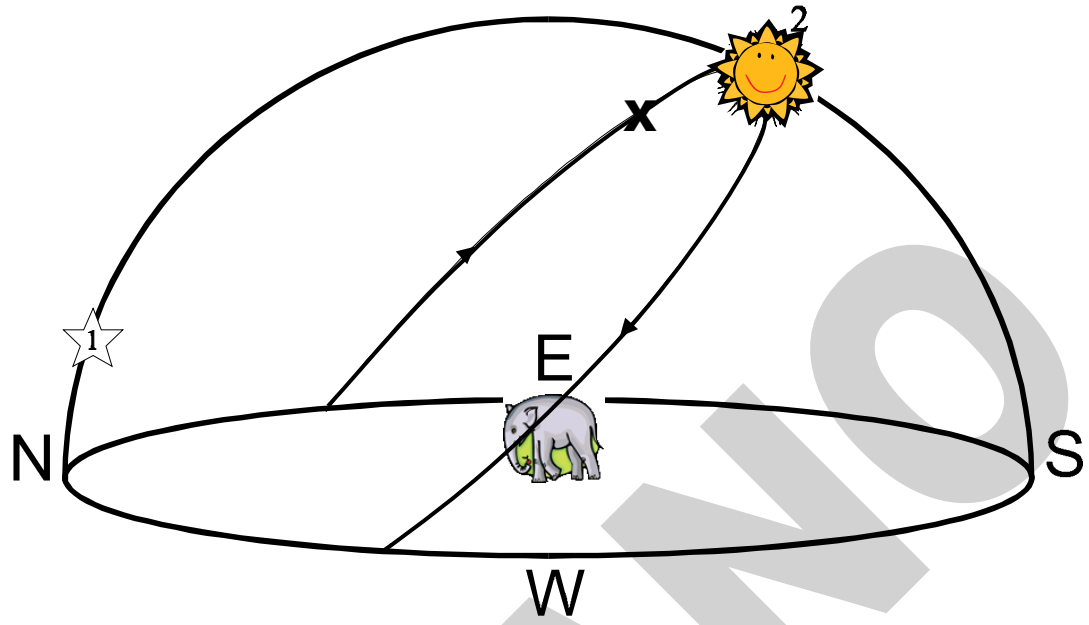
6. What is the solar noon altitude of the Sun for path C-C'?
   (1) 23 ½ °
   (2) 30°
   (3) 60°
   (4) 70 ½ °

7. About how many degrees does the altitude of the Sun change from December 21 to June 21?
   (1) 25°
   (2) 47°
   (3) 60°
   (4) 72°

8. What direction would an observer look to see the Sun set on path D-D'
   (1) NW
   (2) SW
   (3) NE
   (4) W

9. As the Sun appears to move along path B-B', what time of day would an observer at this location have the shortest shadow?
   (1) 9 a.m.
   (2) 12 a.m.
   (3) 5 p.m.
   (4) 12 p.m.

Use the diagram below to answer questions 10 - 18.



10. What is the altitude of star 1? (1) 0° (2) 20° (3) 60° 4 90°

11. What is the azimuth of star 1? _____

12. What is the azimuth of sunrise? _____

13. What time of day is represented by this diagram? _____

14. If the total degrees of arc for this day is 210 degrees, how many daylight hours would be experienced on this day? _____

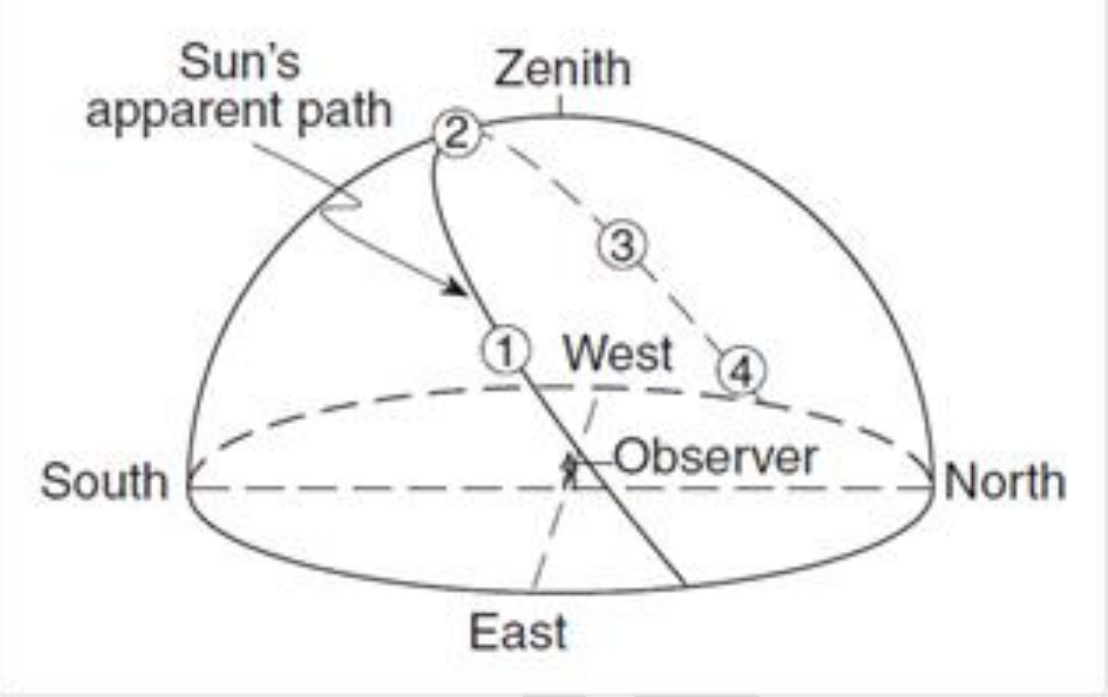
15. What is the altitude Sun at position 2? (1) 10° (2) 30° (3) 60° 4 90°

16. What direction would the elephant's shadow point at the time shown in the diagram? _____

17. If the Sun was located at position X, what time of day would it be? _____

18. What would the azimuth of the Sun be if it was located at position X? _____

Use the diagram below to answer questions 19 – 30.



19. Place an x in the correct place to indicate the position of sunrise on this day.

20. Draw two arrows on the arc path showing the direction that the sun appears to move along the arc path.

21. What is the azimuth of the sunrise position that you indicated? _____

22. Which numbered position represents the sun setting? _____

23. Which numbered position represents solar noon? _____

24. What is the altitude of the Sun when it is solar noon? (1) 15° (2) 45° (3) 75° 4 90°

25. What is the azimuth of the Sun when it is solar noon? _____

26. What is the approximate time of day when the Sun is at position 1? _____

27. What is the azimuth of the Sun when it is at position 3? _____

28. When the Sun is at position 2, in which direction would the observer have to look to see his shadow? _____

29. What happens to the length of the observer's shadow as the Sun proceeds along its daily arc path from position 3 to 4? _____

30. What happens to the length of the observer's shadow as the Sun proceeds along its daily arc path from position 1 to 3? _____