Physics 1061. Stars and Galaxies

Review for Quiz 3. Angles, time, seasons, precession Name:_____

1. The Earth rotates about 1° further in order to line up with the Sun than to line up with a distant star. Hence, the _____ _____ day is longer than the _____ day. (Use 3 words total.)

2. If the center of a cyclical motion is outside of the body, the motion is called _____, if the center of cyclical motion is at the body's center of gravity it is called rotation.

   (a) spinning
   (b) revolution
   (c) chaotic motion
   (d) periodicity
   (e) the twist

3. The Moon and Sun subtend an angle of 1/2 degree. How many arcminutes is this? _____

4. Which hypothetical planet would have the most severe seasons?

   (a) one with axis tilt = 0°
   (b) one with axis tilt = 20°
   (c) one with axis tilt = 30°
   (d) one with axis tilt = 40°
   (e) one with axis tilt = 80°

5. How would increasing the eccentricity (non-circularity) of a planet's orbit influence the severity of its seasons?

   (a) one hemisphere gets more extreme seasons, the other less
   (b) both hemispheres get more extreme seasons
   (c) both hemispheres get less extreme seasons
   (d) there must be some change, but it would depend on when perihelion happened
   (e) no change

6. (T or F) The shortest days of the year in the northern hemisphere are also those with the most direct sunlight.

7. (T or F) The length of daylight hours for a city on the equator is longer than for a city at latitude 40° north on any day of the year.

8. (T or F) The zodiacal constellations (Gemini, Aquarius, etc.) are all centered on the celestial equator.

9. How many of the 88 constellations does the Sun pass through in a tropical year?

   (a) none (b) 8 (c) 11 (d) 12 (e) 13

10. Fall begins the moment the Sun crosses the point in the sky called the _____

    (a) vernal equinox b) summer solstice c) autumnal equinox d) winter solstice e) North Celestial Pole

11. (1pts) How does the parallax angle p of a star depend on the distance D to the star?

    (a) the bigger D the bigger p (b) the bigger D the smaller p (c) no dependence

12. (1pt) How does the parallax angle p depend on the size of the baseline B?

    (a) the bigger B the bigger p (b) the bigger B the smaller p (c) no dependence

13. The formula $d = \frac{1}{p}$ gives the distance measured in _____ to an object with a parallax angle measured in arcseconds.

14. Name two of the three steps in the scientific method.

    _____ and _____.

15. Which of these is not directly linked to *precession*?

    (a) continuously changing coordinates of stars (b) Earth's wobbling spin axis
    (c) vernal equinox shifting W by $50''$ per year (d) lunar phases
    (e) different pole stars in the past

16. T or F. Earth's spin axis would not precess if Earth had no equatorial bulge.

17. T or F. Precession of the equinoxes refers to the way the vernal and autumnal equinox move through the constellations.

18. T or F. Polaris was the closest bright star to the NCP even 10,000 years ago.