Physics 1051. Stars and Galaxies Updated 9/2014.

Review for Quiz 2. The Celestial Sphere, Angles, time Name:_____

1. **The point in the sky directly overhead is called the _____.**
2. **The point in the sky directly beneath our feet is called the _____.**
3. **In a dark site, we can see about _____ stars *above* the horizon.**

   (a) 100 billion b) 100 million c) 100,000 d) 6500 e) 3000
4. **One thing that the celestial sphere fails to model accurately is _____.**

   (a) the distances to stars
   (b) rising and setting motions
   (c) the angular spacings of stars
   (d) the north celestial pole
   (e) the celestial equator
5. **Not including Earth, how many planets were identified by ancient (pre-telescope) astronomers?**

   (a) none b) two c) three d) five e) eight
6. **One can estimate their latitude on the Earth from the**

   (a) spin of the Earth
   (b) the tilt of the Earth's spin axis
   (c) the altitude of the North celestial pole (Polaris)
   (d) the altitude of the Big Dipper (Ursa Major)
   (e) the azimuth of the ecliptic
7. **Lines of equal longitude and latitude on the Earth project onto lines of _____, respectively, on the sky.**

   (a) azimuth and declinaton
   (b) declination and right ascension
   (c) right ascension and declination
   (d) azimuth and altitude

8. The path that the Sun takes relative to the stars, as seen from Earth is the _____.

9. The Earth's equatorial plane is tilted by _____ degrees relative to its orbital plane.

10. Although the Sun is 400 times bigger than the Moon in diameter, the Moon can still cover it up during a solar eclipse because the Sun is also _____.

11. The Earth rotates about 1° further in order to line up with the Sun than to line up with a distant star. Hence, the _____ _____ is longer than the _____. (Use 5 words total.)

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

13. 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°

14. 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 exteme seasons
(c) both hemispheres get less exteme seasons
(d) there must be some change, but it would depend on when perihelion happened
(e) no change

15. (2pts) At a given moment, which marks or features on the celestial sphere will fall on different constellations for observers on different continents of the Earth (i.e., which marks are "location dependent")? (Circle all that apply.)

(a) celestial meridian
(b) ecliptic
(c) north celestial pole

(d) celestial equator

(e) zenith

16. (2pts) Which marks or features on the celestial sphere will fall on the same constellations for observers on different continents of the Earth (i.e., which marks are "location independent")? (Circle all that apply.)

(a) celestial meridian

(b) ecliptic

(c) north celestial pole

(d) celestial equator

(e) vernal equinox

17. (T or F) Changes in the brightness of our planets are imperceptible.

18. (T or F) The position of (Alt., Az.) = (45° , 180°) will appear the same for a stargazer in New York and California.

19. (T or F) The position of (RA, DEC) = (18 hrs, 80°) will appear the same for a stargazer in New York and California.

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

21. Name a planet that is brighter than Sirius. _____.

22. Which planet is fainter than Sirius (at maximum brightness) but is still easily visible to the naked eye? _____.

23. Right ascension is defined to be zero hours at one of the intersections of the _____ with the _____.

24. Declination is defined to be zero all along the _____ _____.

25. Altitude is defined to be zero all along an observer's _____.

26. 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

27. A lunar eclipse occurs when the _____ is in the middle of the Earth, Moon, Sun system.

28. A solar eclipse occurs when the _____ is in the middle of the Earth, Moon, Sun system.

29. Since it takes 29.5 days for the Moon to complete its phases, the minimum time between two lunar eclipses is...

(a) about 2 weeks (b) about 1 year (c) about 6 months (d) 60 days (e) about 1 month

30. Since it takes 29.5 days for the Moon to complete its phases, the minimum time between two eclipses is...

(a) about 2 weeks (b) about 1 year (c) about 5.7 months (d) 60 days (e) about 1 month

31. The Saros cycle is

(a) the time between extinctions (b) about 1 year (c) the time of 18 yrs 11.33 days (d) the time between solar eclipses (e) the synodic period of the planet Saros.

32. Lunar eclipses only occur during which phase of the Moon?

(a) New Moon (b) 1st quarter (c) Full Moon (d) 3rd quarter

33. Solar eclipses only occur during which phase of the Moon?

(a) New Moon (b) 1st quarter (c) Full Moon (d) 3rd quarter

34. Eclipse seasons, the 35 day period when eclipses can occur, are about how many months apart?

(a) 2 (b) 3 (c) 6 (d) 12

35. It is no coincidence that word "ecliptic" sounds like "eclipse". This is because

(a) both look like big "lips"
(b) there must be an eclipse when the Moon crosses the ecliptic.
(c) eclipses only occur when the Moon is near the ecliptic
(d) the shadow of the Moon follows the ecliptic

36. The darkest portion of a shadow formed by a planet or moon is called the _____?

(a) cone (b) umbra (c) apex (d) penumbra

37. The distance between the Moon and the Earth is how many times larger than the size of the Moon?

(a) 4 (b) 10 (c) 45 (d) 110

38. The Earth is about how many times larger than the Moon (in diameter)?

(a) 4 (b) 10 (c) 45 (d) 110

39. (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

40. (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

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

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

_____ and _____.