Physics 1061. Stars and Galaxies

Quiz 5 REVIEW. Measuring the Stars Name:_____

1. The best way to measure a star's parallax is to _____.

   (a) take images from opposite sides of the Earth.

   (b) take a spectrum.

   (c) take a single image from Mars.

   (d) take several images at different positions in Earth's orbit.

2. Stellar parallax would be more precise if _____

   (a) Earth's orbit was much larger. (b) the stars were farther away. (c) the Earth moved faster along its orbit. (d) all of these (e) none of these

3. If a star has a parallax of 0.1 arcseconds, then its distance will be _____. (Recall d=1/P.)

   (a) 1 pc (b) 5 pc (c) 50 pc (d) 100 pc (e) the SRD

4. T or F. The Greek astronomer Hipparchus classified the brightest stars as "6th magnitude" and the faintest stars as "1st" magnitude.

5. What is the distance to Proxima Centauri, the nearest star to the Sun? _____

6. Which magnitude depends on the distance of the star? (m or M)

7. Which magnitude is a substitute for luminosity on the HR diagram? (m or M)

8. If the absolute magnitude (M) of a star is known, what other piece of information allows us to determine its distance?

   (a) temperature (b) redshift (c) relative magnitude (m) (d) mass (e) radius

9. If you lived on an asteroid 3 AU from the Sun, the flux from the Sun would be _____what is measured on Earth.

   (a) the same as (b) 1/2 (c) 1/4 (d) 1/9 (e) 1/27 times

10. If a star's apparent magnitude is a larger number than its absolute magnitude, then

    (a) it must be closer than 10 LY (b) it must be farther than 10 pc (c) it must be farther than 100 LY (d) it must be closer than 10 pc (e) it must be closer than 1 pc

11. If the Sun were moved to a distance of 10 pc (32.6 ly), it's apparent magnitude would change from -26.7 to _____.

    (a) 26.7 (b) -21.9 (c) 0.0 (d) +4.8 (e) +6.0

12. The _____of a star is a measure of the total energy radiated by the star in one second.

    (a) flux (b) apparent magnitude (c) luminosity class (d) spectral type (e) luminosity

13. If two stars produce the same total amount of energy per second in their cores, they have the same _____.

    (a) apparent brightness (b) luminosity (c) flux (d) color (e) apparent magnitude

14. Star A has a radius 3 times greater than the Sun, and yet it has the same surface temperature. Its luminosity must be _____

    (a) 1/100 $L_\odot$ (b) 9 $L_\odot$ (c) 81 $L_\odot$ (d) 1 $L_\odot$ (e) 1/9 $L_\odot$

15. A clue to the radius of a star is seen in the _____ of its absorption lines

    (a) width
    (b) height
    (c) lack
    (d) abundance
    (e) frequency

16. Cool stars can be very luminous if they are

    (a) small (b) large (c) hot (d) close to our solar system (e) class V

17. The original spectral classification system called the stars with the strongest hydrogen absorption _____stars.

    (a) O (b)A (c) G (d)M (e)B

18. What are the 7 main spectral types, ordered from hot to cold? _____

19. The spectral type of the Sun is _____.

    (a) M4 (b) OB (c) A2 (d) G0 (e) G2

20. Compared to the spectral lines in the solar spectrum, lines in a supergiant spectrum are

    (a) thinner (b) broader (c) weaker (d) stronger (e) b & c

21. A G2III star must be _____ in diameter than a G2V star.

    (a) bigger (b) smaller (c) equal

22. Which type of binary star will provide the most accurate star mass measurement?

    (a) spectroscopic binary (b) optical double (c) visual binary (d) eclipsing binary (e) cataclysmic binary

23. A short period eclipsing binary will _____

(a) be more luminous than a visual binary (b) also be detectable as binary spectroscopically (c) give off most of its light in the infrared (d) show a fixed Doppler shift in its spectral lines (e) have a high proper motion

24. The *total* mass of a binary system can be calculated from which quantities?

(a) surface temperature ratios (b) orbital period and eccentricity (c) stellar radii (d) orbital radius and period (e) period alone

25. There is a mass-luminosity relationship for main sequence stars because main sequence stars shine by fusion of hydrogen and _____

(a) hydrogen fusion produces helium. (b) stars expand when they become giants. (c) the fusion rate increases when the core is compressed by weight. (d) the mass absorbs the light. (e) all stars on the MS have the same radius.

26. The most abundant element in stars (and the ISM) is _____

(a) Helium (b)Lithium (c)Hydrogen (d)Oxygen (e)Carbon

27. Barnard's star is famous for having the largest value for this stellar property, 10.4 "/year. What is the property?

(a) radial velocity (b) proper motion (c) parallax (d) transverse speed (e) rotation

28. To locate the stars with the smallest radii on an H-R diagram, look to the _____.

(a) top (b) top and right (c) left (d) bottom and left (e) right

EXTRA CREDIT (1pt) If a star had an absolute magnitude of +10 and an apparent magnitude of +5, how far away would it be?

(1pt) If a cluster was made up of 10,000 stars with the same absolute magnitude as the Sun, what would be the cluster's absolute magnitude?