

1. Our best stellar parallax measurements to date come from
 - A) radio interferometry.
 - B) observations made by astronauts.
 - C) ground based measurements taken six months apart.
 - D) the Keck telescope.
 - E) the Hipparcos satellite.
2. A star has a parallax of $.05''$, its distance is
 - A) 5 light years.
 - B) 20 light years.
 - C) 66 light years.
 - D) 200 parsecs.
 - E) 660 light years.
3. The Hipparcos data give us
 - A) an accurate distance to the Moon.
 - B) information on only the 6,000 brightest stars.
 - C) parallaxes as small as $0.005''$
 - D) distances to about 100 billion stars, practically everything in the Milky Way Galaxy
 - E) parallaxes to the nearest galaxies.
4. Which statement about stellar motion is FALSE?
 - A) Proper motion is measured in intervals of six months.
 - B) Radial velocity is measured by the Doppler shifts of the spectral lines.
 - C) The space velocity can be found from the radial and transverse velocities.
 - D) The closer stars usually show larger proper motions.
 - E) You must also know the parallax to get the transverse velocity.
5. If spectroscopic luminosity classification gives us an estimated distance to the faint star SAO 47552 of about 3300 light years, then its parallax would be only
 - A) $3.3''$
 - B) $0.1''$
 - C) $0.033''$
 - D) $0.01''$
 - E) $0.001''$.
6. A star has a parallax of 0.01 arcseconds. Its distance is
 - A) 0.01 parsecs.
 - B) 0.1 parsecs.
 - C) 1 parsec.
 - D) 10 parsecs
 - E) 100 parsecs.
7. A star is 10 parsecs from Earth. Which statement is true?
 - A) The star is about 33 ly away.
 - B) The star's apparent magnitude is smaller than its absolute magnitude.
 - C) The star is in a different galaxy.
 - D) The star's parallax is 1.0 arc seconds.
 - E) The star's apparent magnitude is larger than its absolute magnitude.
8. If Vega is apparent magnitude zero, and Deneb first magnitude, then
 - A) Vega is about $100\times$ brighter than Deneb.
 - B) Deneb must be a main sequence star, and Vega a giant.
 - C) Deneb is one magnitude brighter than Vega.
 - D) Vega must be $2.5\times$ more luminous than Deneb.
 - E) Vega is $2.5\times$ brighter than Deneb.
9. The stars α Cygni and β cygni are in the constellation Cygnus. Which statement is true?
 - A) α must be the eastern most star in the constellation.
 - B) β cygni appears brighter.
 - C) β appears redder.
 - D) α cygni appears brighter.
 - E) β is hotter.
10. The full Moon's apparent magnitude is
 - A) -12.5
 - B) $+4.83$
 - C) -1.4
 - D) -26.2
 - E) $+12.7$
11. A star's absolute magnitude is its apparent brightness as seen from
 - A) Pluto.
 - B) Alpha Centauri.
 - C) 10 light years distance.
 - D) 33 light years distance.
 - E) 100 parsecs distance.
12. Rigel has an apparent magnitude of $+0.18$ and Betelgeuse an apparent magnitude of $+0.45$. What can you conclude from this?
 - A) Betelgeuse must be closer to Earth.
 - B) Rigel must be closer to Earth.
 - C) Rigel is brighter than Betelgeuse.
 - D) Betelgeuse is brighter than Rigel.
 - E) Both stars are brighter than the full Moon.
13. On a night when a human eye can see a fourth magnitude star, a 60mm telescope, with $100\times$ the surface area as our pupil, would be able to just barely detect
 - A) thirteenth magnitude Pluto
 - B) eighth magnitude Uranus
 - C) ninth magnitude Barnard's Star
 - D) eleventh magnitude Tethys, Saturn's second largest moon
 - E) seventh magnitude Titan, Saturn's largest moon
14. How much brighter will a 4th magnitude star appear than a 6th magnitude star?
 - A) $8\times$
 - B) $6.25\times$
 - C) $16\times$
 - D) $2.5\times$
 - E) $2.0\times$

15. Two stars both have parallaxes of 0.023", but star A has apparent magnitude +2.3, while star B is magnitude +7.3. Which statement is true?
- Star A must be ten times closer.
 - Star B must be ten times more luminous.
 - Nothing, since we do not know their absolute magnitudes.
 - Star A is both 100× brighter and larger than star B.
 - Star A is both 100× brighter and more luminous than star B.
16. The spectral type of a star measures its
- temperature.
 - luminosity.
 - chemical composition.
 - size.
 - mass.
17. Which of these stars would be the hottest?
- K9
 - B0
 - A0
 - G2
 - M10
18. What can be said with certainty about a red star and a blue star?
- The red star is closer to Earth than the blue star.
 - The red star is more massive than the blue star.
 - The blue star has a greater proper motion than the red star.
 - The blue star is hotter than the red star.
 - The red star has a greater radial velocity than the blue star.
19. Which of these pairs of binaries would appear most similar in color telescopically?
- F3IV and G8III
 - F0V and G9III
 - A2Ia and F7Ia
 - M1V and K9V
 - O2V and M4Ia
20. A star's color index directly tells us its
- distance.
 - temperature.
 - radial velocity.
 - age.
 - proper motion.
21. In general, what can be said about type O and B stars compared to type K and M stars?
- They are neither hotter nor cooler, younger nor older.
 - They are cooler and younger.
 - They are cooler and older.
 - They are hotter and younger.
 - They are hotter and older.
22. Compared to a type A0 star, a type A9 star is
- more massive.
 - hotter.
 - cooler.
 - bluer.
 - more luminous.
23. The H-R diagram can plot
- radius versus mass.
 - radius versus luminosity.
 - temperature versus mass.
 - apparent magnitude versus spectral classes.
 - temperature versus luminosity.
24. The stars with masses comparable to our Sun's, but sizes like the earth are
- white dwarfs.
 - neutron stars.
 - red giants.
 - blue main sequence stars.
 - red main sequence stars.
25. In the H-R diagram, what are the two most important types of data plotted?
- absolute and apparent magnitudes
 - apparent magnitudes and temperatures
 - spectral classes and absolute magnitudes
 - luminosities and masses
 - sizes and temperatures
26. On the H-R diagram, the bright blue stars that dominate the naked-eye sky lie
- in the middle of the main sequence.
 - at the top right.
 - at the lower left.
 - at the lower right.
 - at the top left.
27. On the H-R diagram, our Sun lies
- at the top left.
 - at the bottom right.
 - about the middle.
 - at the bottom left.
 - at the top right.
28. On the H-R diagram, the white dwarfs Sirius B and Procyon B lie
- at the top left.
 - to the bottom right on the main sequence.
 - at the top right.
 - in the middle of the main sequence.
 - at the lower left of the main sequence.
29. On the H-R diagram, red supergiants like Betelgeuse lie
- about the middle.
 - on the bottom, coolest portion of the main sequence.
 - to the lower left edge.
 - at the top left.
 - at the top right.

30. Compared to the size of the Sun, stars of all types range from
- A) 0.1 to 10 solar radii.
 - B) 0.5 to 50 solar radii.
 - C) 0.01 to 1,000 solar radii.
 - D) 0.08 to 8,000 solar radii.
 - E) 0.001 to 50,000 solar radii.
31. A star near the lower right of the H-R diagram is likely to be
- A) hot, bright, and very large.
 - B) blue, with high luminosity.
 - C) red, with high luminosity.
 - D) yellow, with luminosity similar to our Sun's.
 - E) red, with low luminosity.
32. Binary stars separated enough to be resolved in a telescope are called
- A) visual binaries.
 - B) astrometric binaries.
 - C) spectroscopic binaries.
 - D) orbital binaries.
 - E) line-of-sight binaries.
33. The Doppler shift is used to find
- A) visual binaries.
 - B) astrometric binaries.
 - C) spectroscopic binaries.
 - D) photometric binaries.
 - E) eclipsing binaries.
34. Which type of binaries are best studied with a photometer?
- A) astrometric binaries
 - B) eclipsing binaries
 - C) visual binaries
 - D) optical doubles
 - E) spectroscopic binaries
35. If we know the average separation and period of revolution for a binary system, we can then measure
- A) the actual mass of both individual stars.
 - B) their absolute magnitudes.
 - C) the total mass of the system.
 - D) the actual sizes of the two stars.
 - E) the actual luminosity of each star.
36. Stellar masses are measured directly by observations of the motions of
- A) spectroscopic binary systems.
 - B) eclipsing binary systems.
 - C) visual binary systems.
 - D) All of the above can give us their masses.
 - E) Stellar masses cannot be measured directly by any method.
37. Almost all stars fall in a mass range of
- A) 1 to 3 solar masses.
 - B) 0.1 to 20 solar masses.
 - C) 0.01 to 100 solar masses.
 - D) 0.001 to 50,000 solar masses.
 - E) The range of stellar masses is infinite.
38. What information can be gained from the light curves of eclipsing binaries?
- A) their luminosities
 - B) their distances
 - C) their masses
 - D) their temperatures
 - E) their sizes