Quiz Astro 162 Chapter 9

9-1. A star with which of the following classifications is coolest?
a) A4
b) G2 *
c) B8
d) F1

9-2. Parallax measurements are taken of stars to determine:
a) stellar masses
b) stellar surface temperatures
c) stellar diameters
d) stellar distances from Earth *

9-3. What type of star is the Sun?
a) white dwarf
b) supergiant
c) giant
d) main sequence *

9-4. The masses of stars are most accurately measured by observing:
a) their colors
b) their rotation rates
c) their orbits in binary systems *
d) their temperatures

9-5. How bright a star appears in the night sky relative to other stars seen there is called its:
a) luminosity.
b) spectral class.
c) absolute magnitude.
d) apparent magnitude. *

9-6. An apparently isolated star whose entire spectrum alternately redshifts and blueshifts is called a(n):
a) optical double
b) visual binary
c) spectroscopic binary *

9-7. Stars on the Main Sequence have what range of masses?
a) .0008 $M_\odot$ to 1000 $M_\odot$
b) .001 $M_\odot$ to 1000 $M_\odot$
c) .08 $M_\odot$ to 100 $M_\odot$ *
d) 1 $M_\odot$ to 100 $M_\odot$

9-8. How bright is a star with a magnitude of +4.0 compared to a star with magnitude +5.0?

a) 2.5 times brighter *
b) 1/2.5 times as bright
c) 1.25 times brighter
d) 10 times brighter

9-9. Two stars have the same luminosity. As seen from Earth, one star has an apparent brightness of four times the other. The dimmer star

a) is eight times farther away than the brighter star.
b) is four times farther away than the brighter star.
c) is two times farther away than the brighter star. *
d) is two times closer than the brighter star.

9-10. The spectral classification of a star is closely related to the star's

a) apparent brightness.
b) absolute magnitude.
c) luminosity.
d) surface temperature. *

9-11. The spectral type of the Sun is G and the spectral type of the star Antares is K. These facts imply that Antares

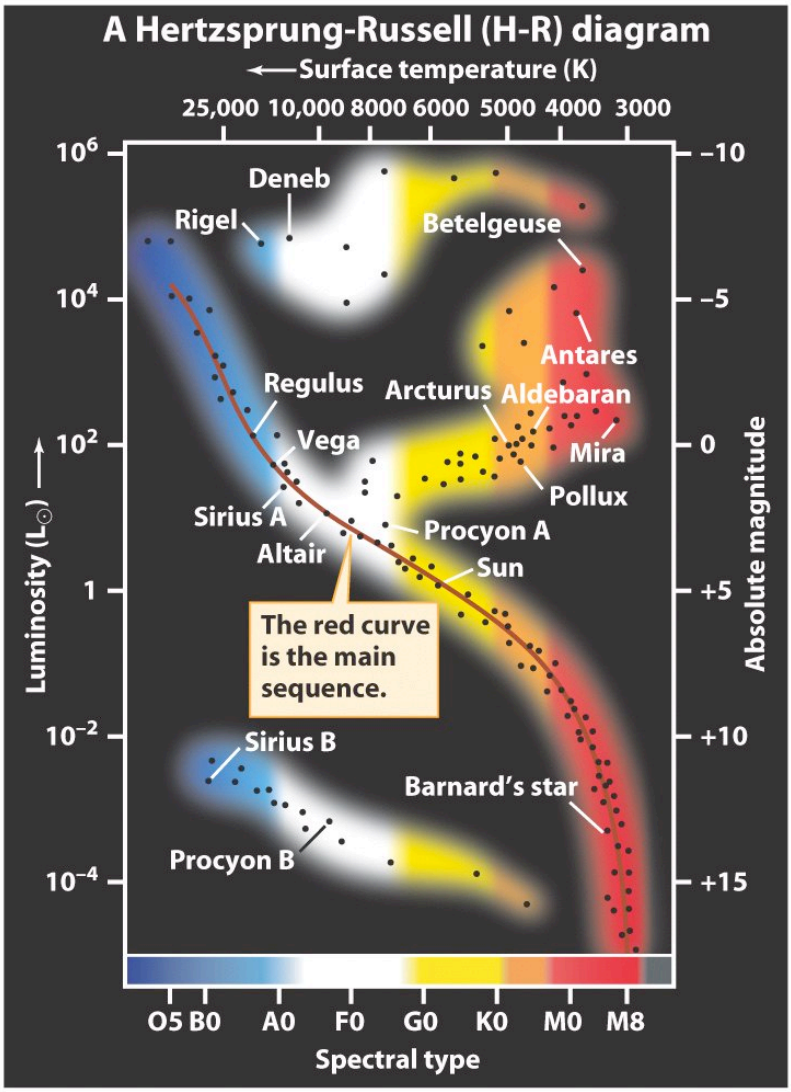
a) has a lower luminosity than the Sun.
b) is hotter than the Sun.
c) has a higher luminosity than the Sun.
d) is cooler than the Sun. *

9-12. Which quantities characterizing a star can only be determined if the distance to the star is known? Assume that the star is not a Cepheid variable.

a) diameter, surface temperature, radial velocity
b) diameter, luminosity, surface temperature
c) luminosity, radial velocity
d) luminosity, absolute magnitude *

9-13. Mira and Barnard's star have different luminosities, as can be seen from the Hertzsprung-Russell diagram. This difference comes about because Mira has a

a) larger diameter than Barnard's star. *
b) smaller diameter than Barnard's star.
c) higher surface temperature than Barnard's star
d) lower surface temperature than Barnard's star.



9-14. A star has a high luminosity (10^2 solar luminosities) and a surface temperature of 3500 K. What type of star is it?

a) A high mass–main sequence star
b) A low mass–main sequence star
c) A red giant *
d) A theoretically predicted object that has not yet been observed

9-15. Betelgeuse has a very high luminosity (40,000 times brighter than our Sun), but its surface is cool (less than 4000 K). Which of the following explains this?

a) Betelgeuse must have a much smaller surface area than the Sun.
b) Betelgeuse is at the lower end of the main sequence.
c) Betelgeuse is at the upper end of the main sequence.
d) Betelgeuse must have a much larger surface area than the Sun. *
e) Betelgeuse must have the same surface area as the Sun.

Chapter 9 Thought/Writing Questions

9-16. Where do the giant stars lie on the Hertzsprung-Russell diagram?

9-17. Why do some binary star systems change brightness?

Misconception-Based Questions

9-18. How close, in miles, is the nearest star to the Sun? (25 trillion miles)

9-19. Are brighter stars always hotter than dimmer stars? Explain