NAME: _____ DATE: _____

Homework #7

1. Parallax of a nearby star is used to estimate its
    1. The distance to an object, measured in parsecs.
    2. The angle taken up by the size (e.g., diameter) of an object, as seen by an observer.
    3. The shift in angular position of an object as it moves in space.
    4. The apparent shift in position of an object as the observer moves.

2. Spectral types of stars (e.g., O, B, A, F, G, K, M) define uniquely their
    1. surface temperature.
    2. distance from Earth.
    3. apparent magnitude.
    4. physical size or diameter.

3. What is a protostar?
    1. A sphere of gas after collapse from an interstellar cloud but before nuclear reactions have begun.
    2. A small interstellar cloud, before it collapses to become a star.
    3. A star near the end of its life, before it explodes as a supernova.
    4. A shell of gas left behind from the explosion of a star as a supernova.

4. At what point in its evolution will a protostar stop shrinking and stabilize into a star?
    1. When nuclear reactions end in its core.
    2. When gravitational contraction has heated up the gas to the point where radiation pressure opposes gravity for the first time.
    3. When it has spun off enough of its matter and is spinning fast enough that centrifugal force opposes the gravitational contraction.
    4. When nuclear processes generate enough energy and internal pressure to resist gravitational contraction.

5. How is the length of a star's lifetime related to the mass of the star?
    1. Lower-mass stars run through their lives faster and have shorter lifetimes.
    2. The lifetimes of stars are too long to measure, so it is not known how (or if) their lifetimes depend on mass.
    3. A star's lifetime does not depend on its mass.
    4. Higher-mass stars run through their lives faster and have shorter lifetimes.

6. When plotting random stars in an H-R diagram, what must be known for each star
    A color and apparent brightness
    B color, apparent brightness and distance
    C apparent brightness and age
    D color and distance

7. Stars on the main sequence
    A have approximately the same age, to within a few million years
    B have extremely low abundances of elements heavier than helium
    C generate energy by hydrogen fusion in their centers
    D are changing slowly in size, by gravitational contraction

8. As a star is forming by the condensing of gases, the gases
   A cool as they fall.
   B heat up as they fall.
   C stay about the same temperature.
   D any of the above, depending upon the mass involved.

9. The longest phase of a star's life is spent as a
   A proto star
   B main sequence star
   C cepheid variable star
   D red giant star

10. The age of a cluster can be determined by analyzing
    A the motion of the stars
    B the number of stars in the cluster
    C the H-R diagram of the cluster
    D cepheid variables in the cluster

11. A planetary nebula is
    A the vastly expanded shell of a dying star.
    B a cloud of gas out of which stars form.
    C a cloud of cold dust in space.
    D the same as a white dwarf.

12. When the sun "dies" it will become a
    A supernova
    B neutron star
    C white dwarf
    D black hole
    E a circular ring around a black hole.

13. The supernova which exploded in 1054 is now
    A visible as an expanding cloud of gas
    B visible as a pulsar
    C both A and B
    D totally dissipated and invisible

14. What are Cepheid variable stars and how are they different than other stars?

15. What is the Roche Lobe and what is its significance in close binary systems?