

Test on Chapters 10 through 19

The value of each question is shown. Please answer each question in the space provided

1. The following questions relate to our Sun:
 - a. (3) What physical process produces the Sun's energy?

 - b. (3) What temperature is required for this process to begin?

 - c. (3) Where in the Sun does this process take place?

 - d. (3) What is the solar wind?

 - e. (5) What causes sunspots?

2. The following questions relate to parallax:
 - a. (3) What is parallax?

 - b. (3) The distance to approximately how many stars was measured using data from Hipparcos?

 - c. (3) In which galaxy were these stars located?

 - d. (3) Approximately how many stars are there in this galaxy?

 - e. (5) Given that the distance to so few stars can be measured using parallax, why is the technique critical to other methods of determining stellar distance?

3. The following questions relate to the Hertzsprung-Russell (H-R) diagram:
 - a. (3) What stellar properties are plotted in an H-R diagram?

 - b. (3) What does it mean to say that a star is a main-sequence star?

 - c. (3) How long has our Sun been a main-sequence star?

 - d. (3) How much longer will our Sun be a main-sequence star?

 - e. (5) At the end of our Sun's main-sequence life, how will the Sun evolve off the main sequence, what will it become?

 - f. (3) Is the temperature of a main-sequence B star like Regulus greater or less than a main-sequence G star like our Sun?

 - g. (3) Is the mass of a main-sequence O star greater or less than our Sun's mass?

 - h. (3) Is the main-sequence life of an M star longer or shorter than our Sun's main-sequence life?

- i. (5) How is the H-R diagram used to determine a star's distance?
4. The following questions relate to end of life of stars:
 - a. (3) What is a supernova?

 - b. (3) What is a neutron star?

 - c. (3) What is a black hole?

 5. The following questions relate to our Milky Way:
 - a. (3) What do we believe is at the center of our Milky Way?

 - b. (3) How are the stars in our Milky Way moving?

 - c. (3) Where is our Solar System located in the Milky Way?

 - d. (5) In terms of the orbits of stars about the Milky Way's galactic center, what is the evidence for the existence of dark matter?

 6. The following questions relate to Hubble's law and the Big Bang. In answering this question it may be helpful to remember that our local group of galaxies, which includes the Milky Way, Andromeda, and the Large and Small Magellanic Clouds, is bound gravitationally to a cluster of galaxies called the Local Group. This cluster is further bound gravitationally to the larger Virgo supercluster of galaxies.
 - a. (3) What would cause the radiation from a galaxy to be redshifted?

 - b. (3) When Hubble looked beyond our own Virgo supercluster of galaxies, what did he discover about the radiation coming from other clusters and superclusters of galaxies?

 - c. (5) What law did Hubble derive from this discovery?

 - d. (5) How do we use Hubble's constant to calculate the age of our universe and what is the current value for the age of our universe?

 - e. (5) How does the Big Bang relate to Hubble's law?

 - f. (5) What does the microwave background radiation have to do with the Big Bang?

 - g. (5) What evidence is there for Dark Energy?