1. An E galaxy contains
   a. mostly lower-main sequence stars and giants.
   b. mostly upper main sequence stars and giants.
   c. mostly upper main sequence stars and gas and dust.
   d. roughly equal numbers of upper and lower main sequence stars.
   e. mostly white dwarfs and supergiants.

2. A spiral (S or SB) galaxy contains
   a. mostly lower-main sequence stars and giants.
   b. mostly upper main sequence stars and giants.
   c. mostly upper main sequence stars and gas and dust.
   d. upper and lower main sequence stars and gas and dust.
   e. mostly white dwarfs and supergiants.

3. An irregular galaxy contains mostly
   a. lower-main sequence stars and giants.
   b. upper main sequence stars and giants.
   c. upper main sequence stars and gas and dust.
   d. upper and lower main sequence stars and gas and dust.
   e. white dwarfs and supergiants.

4. ____ have elongated nuclei with spiral structure extending from the ends of the elongations. The Milky Way is a member of this class of galaxy.
   a. Spiral galaxies
   b. Barred spiral galaxies
   c. Elliptical galaxies
   d. Irregular galaxies
   e. S0 galaxies

5. A mega-parsec is equivalent to
   a. 3.26 light-years.
   b. 206,265 AU
   c. the age of our solar system
   d. a million parsecs.

e. the diameter of the Milky Way galaxy.

6. The Hubble Law is a relation between a galaxy's
    a. mass and its luminosity.
    b. distance and its luminosity.
    c. mass and its recession velocity.
    d. distance and its recession velocity.
    e. mass and its diameter.

7. The cluster method (motions of galaxies in a cluster of galaxies) can be used to determine the cluster's mass
    a. luminosity.
    b. distance.
    c. mass.
    d. diameter.
    e. age.

8. _____ can be used to determine the galaxy's mass if the galaxy is reasonably close so that the Doppler shift of the galaxy disk material can be measured at several distances from the galaxy's center relative to the center.
    a. The Hubble constant
    b. A galaxy's color
    c. A galaxy's rotation curve
    d. A galaxy's diameter
    e. The velocity dispersion method

9. Gravitational lensing
    a. occurs when light passes near a massive object and is deflected by the object's gravitational field.
    b. can be used to determine the luminosity of a galaxy.
    c. occurs when the mass of a galaxy is greater than expected from the luminosity of the galaxy.
    d. occurs when the mass of a galaxy is less than expected from the luminosity of the galaxy.
    e. can be used to determine the recessional velocity of a galaxy.

10. Poor clusters
    a. contain more than 1000 stars and are found in the halo of the galaxy.
    b. contain lots of young stars and are found in the disk of a spiral galaxy.
    c. contain more than 1000 galaxies and are generally elliptical in shape.
    d. contain fewer than 1000 galaxies and tend to be irregularly shaped.
    e. are found in the nucleus of the galaxy.

11. A ____ generally contains well over 1000 galaxies and is quite dense. They often contain many giant elliptical galaxies.
    a. local group
    b. poor cluster
    c. rich cluster
    d. tidal tail
    e. quasar

12. The Milky Way is part of

    I.   a poor cluster.
    II.   a rich cluster.
    III. the Virgo Cluster.
    IV.   the Local Group.

    a. I and III
    b. I and IV
    c. II and III
    d. II and IV
    e. just III