

ASTR 135 Faux Final Exam

Use separate sheets for the answers to these 20 questions. This test is never due.

- 1) Make a table with four columns. Fill it out with column headings: (1) approximate age of the moon in days, where new = 0 days, (2) name of the lunar phase, (3) a sketch of the appearance of the lit portion of the lunar disk, and (4) the time of day when this lunar phase is seen high in the sky, loosely speaking, overhead.
- 2) Sketch a celestial sphere. Label NCP, SCP, Celestial equator, ecliptic, equinox points and solstices. Indicate how right ascension and declination are measured (in words if it is not clear how to draw them).
- 3) Few-sentence answer: describe the path through the sky the sun takes as it rises and sets through the seasons, including approximate compass headings for rising and setting locations (azimuths). Assume USA as your location.
- 4) Describe circumpolar stars and give the range of declinations in which circumpolar stars exist as seen from latitudes 0° , 10° , 30° , 60° , and 90° .
- 5) List the 7 common wavelength regimes of light in wavelength order. Indicate which transmit through the earth's atmosphere.
- 6) Sketch an ellipse as applied to the solar system by Kepler, including foci, major axis, minor axis, semimajor axis, sun, planet, perihelion, aphelion, and center.
- 7) Explain Kepler's other two laws of planetary motion.
- 8) Write Newton's laws of motion and his law of universal gravitation.
- 9) Sketch a top view and a side view of the Milky Way galaxy. What are the rough distance scales? Label nucleus, bulge, and halo in the spheroid and disk. Illustrate spiral arms. Note the approximate position of the solar system.
- 10) Make a table of disk vs. spheroid for the Milky Way or other galaxies. List properties such as overall color, presence of gas, presence of dust, ages of the stars, type of star cluster, star orbit shapes and orientations, presence of star formation, presence of spiral structure.
- 11) Compare and contrast RR Lyrae variable stars with Cepheid variable stars in terms of physical characteristics and historical uses for them as applied to galaxies.
- 12) Draw a "Hubble tuning fork" classification diagram, explaining the differences in the appearances of each type of galaxy.
- 13) What is the "local group" of galaxies and what are the most massive galaxies in it?
- 14) What is the evidence for dark matter?
- 15) Sketch, for galaxies within 1000 Mpc, the velocity-distance diagram. State the common name of the diagram. What is the implication of the diagram for cosmology?
- 16) Describe the origin and appearance of the cosmic microwave background radiation.
- 17) Describe the milestone events in the history of the big bang, starting with the separation of gravity from the fundamental four forces and ending with the formation of large scale structure (superclustering) in the universe.
- 18) Describe the phenomenon of galaxy clustering and superclustering in terms of when they happened in cosmic time relative to star formation and galaxy formation, and the importance of dark matter.
- 19) What is the fate of the universe and why do astronomers conclude that?
- 20) What are the ages of the universe, solar system, and first hard-shelled sea invertebrates?