

Review for Astro 138, Fall 2017. This is an exercise, not to be turned in.

This review covers only recent material. Recall that tests are cumulative, so that the previous material is also needed: basic coordinates, seasons and moon phases, light, gravity & orbits, thermal radiation, atoms & molecules and line spectra, telescopes, and the Grand Tour of the Planets where all the planets and the larger moons are summarized.

1. Describe the orbital properties of the major groups of asteroids.
2. How do asteroid bulk compositions change from the inner solar system to the outer solar system?
3. Describe the composition of a comet nucleus. Explain the formation and structure of a comet's tail.
4. Connect comet orbits and the Oort cloud.
5. What properties of Pluto place it in the Kuiper Belt and not among the major planets?
6. Explain the origin of meteor showers.
7. Explain how a giant impact can cause a mass extinction.
8. Review again (Ch. 6 and 15) the solar nebula hypothesis, also known as the condensation theory of the origin of the solar system. List the regularities and irregularities of solar system objects.
9. Describe at least four methods of detecting planets around distant stars.
10. Because some stars have "hot Jupiters," does that destroy the solar nebula hypothesis? (No, it doesn't. Firstly, large planets can condense near the sun even without water as a building block. Secondly, there is inward planet migration that can bring planets inwards during the heavy disk phase.)
11. About how many earthlike planets in the habitable zone (what's that?) exist in the Milky Way galaxy? (At least 3 billion, using Kepler mission statistics.)
12. Summarize the thermonuclear reaction that powers the sun.
13. Describe the radiative and convective zones in the solar interior.
14. Describe the photosphere, chromosphere, and corona (the three layers of the solar atmosphere)
15. Describe the variable magnetic field of the sun, its 22 year cycle, and observable effects.
16. How old is the sun? (4.55 billion years) How long will the sun last? (10 billion years lifetime)
17. Universe is 14 billion years old. Milky Way and most galaxies are 13 billion years old.