Note: All Problems are from *The Cosmic Perspective* (6ed)

**Chapter 6**

**Review Problems**

2. For purposes of astronomy, what advantages does a camera have over the human eye? What advantages do CCDs have over photographic film?

4. What is the diffraction limit, and how does it depend on a telescope’s size and the wavelength of light being observed?

8. What do we mean by spectral resolution? Why is higher spectral resolution more difficult to achieve?

10. Study Figure 6.22 and describe how deeply each portion of the electromagnetic spectrum penetrates Earth’s Atmosphere. Based on your answers, why are space telescopes so important to our understanding of the universe?

**Quick Quiz**

*Choose the best answer to each of the following. Explain your reasoning with one or more complete sentences.*

23. How much greater is the light-collecting area of a 6-meter telescope than a 3-meter telescope? (a) two times (b) four times (c) six times

24. Suppose that two stars are separated in the sky by 0.1 arc-second. If you look at them with a telescope that has an angular resolution of 0.5 arc-second, what will you see? (a) two distinct stars (b) one point of light that is the blurred image of both stars (c) nothing at all

28. The twinkling of stars is caused by (a) variations in stellar brightness with time. (b) light pollution. (c) motion of air in our atmosphere.

29. If you wanted a radio telescope to achieve the same angular resolution as a visible-light telescope, it would need to be (a) much larger. (b) slightly larger. (c) in space.

**Quantitative Problems**

*Be sure to show all calculations clearly and state your final answers in complete sentences.*

42. Light-Collecting Area.

a. How much greater is the light-collecting area of one of the 10-meter Keck telescopes than that of the 5-meter Hale telescope? b. Suppose astronomers built a 100-meter telescope. How much greater its light collecting area than that of the 10-meter Keck telescope?
Chapter 7

Review Problems

1. What do we mean by comparative planetology? Does it apply only to planets?

5. What are the four major features of our solar system that provide clues to how it formed? Describe each one briefly.

6. What are the basic difference between the terrestrial and jovian planets? Which Planets fall into each group?

9. What are asteroids? Where do we find most asteroids in our solar system?

Test Your Understanding

Decide whether the statement makes sense (or is clearly true) or does not make sense (or is clearly false). Explain clearly; not all of these have definitive answers, so your explanation is more important than your chosen answer.

15. Pluto orbits the Sun in the opposite direction of all the other planets.

16. If Pluto were as large as the planet Mercury, we would classify it as a terrestrial planet.

17. Comets in the Kuiper belt and Oort cloud have long, beautiful tails that we can see when we look through telescopes.

18. Our Moon is about the same size as moons of the other terrestrial planets.

19. The mass of the Sun compared to the mass of all the planets combined is like the mass of an elephant compared to the mass of a cat.

20. On average, Venus is the hottest planet in the solar system – even hotter than Mercury.

21. The weather condition on Mars today are much different than they were in the distant past.

22. Moons cannot have atmospheres, active volcanoes, or liquid water.

23. Saturn is the only planet in the solar system with rings.

24. We could probably learn more about Mars by sending a new spacecraft on a flyby than any other method of studying the planet.

Quick Quiz

Choose the best answer to each of the following. Explain your reasoning with one or more complete sentences.

26. Which terrestrial planets have had volcanic activity at some point in their histories? (a) Only Earth (b) Earth and Mars (c) all of them.

33. Are there any exceptions to the rule that planets rotate with small axis tilts and in the same direction that they orbit the Sun? (a) No (b) Venus is the only exception. (c) Venus and Uranus are exceptions.
Short-Answer/Essay Questions

39. Two Classes of Planets. In terms a friend or roommate would understand, write a paragraph explaining why we say that the planets fall into two major categories and what those categories are. Do all planets fit in the two groups? Explain.