

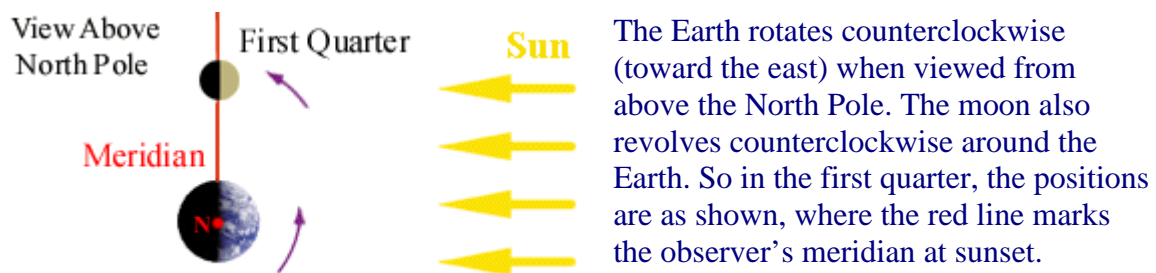
Astronomy 161 Exam 2

October 21, 2002

YELLOW VERSION

Select the single best answer for each question, unless otherwise instructed. No notes or calculators are permitted. Each question is 1 point unless otherwise noted.

1. If the Sun is just setting, and the Moon is at its first quarter phase, the Moon will be
- a. on the western horizon.
 - b. on the meridian.
 - c. on the eastern horizon.
 - d. below the horizon.



2. Two remarkable aspects of our solar system that must be accounted for in any theory of cosmogony are that

- a. the planets all have the same density and composition.
- b. all of the planets revolve around the Sun in the same sense as the Sun rotates, and the orbits of all of the planets lie in nearly the same plane.
- c. all of the planets rotate in the same sense as the Sun, and all have a density similar to that of water.
- d. the orbits of all of the planets lie in nearly the same plane, and all have the same composition.

3. When the Moon is at opposition to the Sun and in the plane of the ecliptic, the result will be

- a . a new Moon. b. a solar eclipse. **c.** a lunar eclipse. d. minimal tides.

This means the Moon and Sun are in opposite directions from the Earth, so the Earth is between the Moon and Sun if the Moon is in the same plane as the Earth and Sun, which is the ecliptic plane.

4. Match each statement to a planet and write its name. You can use the planets more than once. Print your answer clearly. (10 points)

___ **Venus** ___ has the highest average surface temperature.

___ **Pluto** ___ is the only planet whose orbit is significantly tilted with respect to the ecliptic.

___ **Venus** ___ rotates slowly in retrograde motion.

___ **Mars** ___ has a day which is just slightly longer than one Earth day.

___ **Mercury** ___ has a rotational period in tidal resonance with its solar orbit.

___ **Earth** ___ is the densest planet in the solar system.

___ **Jupiter** ___ is the largest Jovian planet.

___ **Mars** ___ shows evidence of running water on its surface in the past, but not the present.

___ **Mercury** ___ has an iron core making up much of its interior, but no significant magnetic field.

___ **Earth** ___ has the strongest magnetic field of the Terrestrial planets.

10. The ozone hole

- a. appears each spring over Antarctica and disappears after a few months.
- b. is a permanent depletion in the ozone levels over Antarctic.
- c. is a temporary depletion in ozone levels worldwide that occurs every spring.
- d. is a permanent depletion in ozone levels worldwide.

11. Compared with the near side of the Moon, the far side is

- a. cooler.
- b. a darker color.
- c. rougher.
- d. smoother.
- e. more volcanically active

The far side of the moon has more of the rough highlands and few maria.

12. Match the theory of the moon's formation to each statement. Write the letter corresponding to the theory in each blank. You can use each theory more than once. (7 points)

- a. capture
- b. co-accretion
- c. fission
- d. large impact

 d has the best match to current data.

 a would tend to put the Moon in an extremely elliptical orbit, and create large tidal forces.

 c would suggest that the Earth and Moon have more similar compositions than they actually do and is unsupported by any dynamical explanation of how it could happen.

 b is dynamically feasible, but suggests that the Earth and Moon are too similar in composition, and probably would give the Earth an excessively long rotational period.

 a does not explain why the Earth and Moon are so similar as they are.

 d assumes a planetesimal the size of Mars struck the Earth at one time.

 c suggests that the creation of the Pacific Ocean and moon are connected.

13. The presence of scarps (cliffs) on Mercury's surface is thought to be due to

- a. the activity of tectonic plates similar to those on Earth.
- b. bombardment of Mercury by large planetesimals in the early the solar system.
- c. a shrinking of Mercury's core in the relatively recent past.
- d. erosion by Mercury's tenuous atmosphere.

Mercury only has one tectonic plate. The cliffs are thought to be due to the core's shrinking.

14. Which of the following is **not** a similarity of Venus and Mars?

- a. Both have atmospheres containing more than 95% carbon dioxide.
- b. Both have strong evidence of past liquid water on the surface.
- c. Both have been explored by probes landing on the surface.
- d. Both have such weak magnetic fields they are difficult to explain.
- e. Both have mountains much higher than any on Earth.

It is unknown whether Venus ever had liquid water, but clear evidence exists that Mars did at one time, although the liquid water which caused this is no longer present on the surface.