

# AY1 Homework for Quiz 1: Spring 2017

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**1. If the Earth's spin axis was not tilted with respect to the Earth's orbital plane (around the Sun), which of the following would be true, which false?**

\_\_\_ The number of daylight hours in a day would not change through the year.

\_\_\_ The length of a day would increase from 24 hours to 365 days

\_\_\_ The change of seasons would become more pronounced in the Northern Hemisphere.

\_\_\_ There would be no change in the pattern of the seasons compared to the real situation

**2. What time does the new moon rise? Draw a picture to demonstrate your answer.**

**3. Given that speed of light,  $c=300,000$  km/sec, how many miles are there in a "light minute"?**

- 4. Suppose you lived on the Moon where there is essentially no atmosphere. Label the following statements as True (T) or False (F)**

\_\_\_ The Sun would appear redder compared to as seen from Earth during the day

\_\_\_ The color of the sky (looking away from the Sun during the day) would be black

\_\_\_ At sunset on the moon, the Sun would appear redder than it does at noon

\_\_\_ The “green flash” would be a “red flash”

- 5. Use scientific notation to express the following numbers.**

A. 1000 =

B. 0.02 =

C.  $1/2$  =

D. 300,000 =

- 6. Humans have been present for approximately what fraction of the Earth’s history?**

A. 90%

B. 50%

C. 1%

D. a tiny fraction much less than 0.0001%

- 7. What are the primary advantages of using telescopes (name three)?**

- 8. Day and night on Earth are due to:**

A. The spin of the Earth on its axis

B. The tilt of the Earth’s spin axis with respect to its orbital plane around the Sun

C. The Proclamation of 1497

D. The motion of the Sun through space

- 9. Why isn't there a lunar eclipse every month when the full moon passes through the Earth's shadow?**
- 10. What do radio waves and visible light electromagnetic radiation have in common and in what properties do they differ?**
- 11. What color is a yellow banana slug illuminated with blue light?**
- A. Yellow
  - B. Green
  - C. Blue
  - D. Black
- 12. Consider a 1-meter-radius copper sphere heated to 100C and a 1-meter-radius clay sphere painted black heated to 100C. Label the following true (T) or false(F):**
- A. The copper sphere will produce radiation at shorter wavelengths (higher energies)
  - B. The copper sphere will produce more total electromagnetic radiation
  - C. The two spheres will produce an electromagnetic spectrum that is identical
  - D. The copper sphere will produce a distinctive emission-line spectrum
- 13. Make a diagram that demonstrates "retrograde motion" of Mars as seen from Earth.**

**14. Which of the following are found in the Solar System?**

- asteroids
- gas-giant planets
- comets
- planets

**15. The emission-line spectrum of each element shows a unique pattern of wavelengths. Which of the following statements best states the underlying physical reason for that?**

- Each element has a unique atomic weight
- Each element has a unique set of electron “allowed” orbital levels
- Each element travels at a different speed in a gas of a given temperature
- Each element has a different number of neutrons in its nucleus

**16. A hot gas emits what kind of spectrum?**

- Absorption-line spectrum
- Emission-line spectrum
- Continuum
- All of the above

**17. Why is there almost no atomic hydrogen or helium in the atmospheres of the inner four planets in the Solar System?**

**18. Why is the surface of Venus hotter than the surface of Mercury even though Mercury is much closer to the Sun?**