ASTR-1 Spring 2017: Quiz 1

1. **Different than the Earth with its 23.5 degree tilt between its spin axis and orbital axis, Venus has a spin axis that is aligned with its orbital axis. For Venus, label each of the following True (T) or False (F)**

__F__ The seasonal changes on Venus would be most pronounced at the equator and least pronounced at the poles

__T__ The number of daylight hours in a day anywhere on Venus would not change through the Venus year.

2. **Use scientific notation to express the following numbers.**

   A. $1000 = 10^{3}$
   B. $0.002 = 2 \times 10^{-3}$
   C. $1/100 = 0.01 = 10^{-2}$
   D. $30{,}000 = 3 \times 10^{4}$

3. **What time does the full moon (phase where we can see the full sunlit side) rise? Draw a picture to demonstrate your answer.**

At Sunset

Sun

Earth

Moon

4. **Suppose you lived on a planet with an atmosphere that scattered red light more efficiently than blue light. Label the following True (T) or False (F) for that planet.**

__T__ The Sun would appear redder at noon than it did at sunset

__T__ The color of the sky looking away from the Sun during the day would be red

5. **Day and night on Earth are due to (check any that are true):**

___ A. The tilt of the Earth's spin axis with respect to its orbital plane around the Sun
___ B. The influence of the Moon's gravity
___ C. The spin of the Earth on its axis
___ D. The motion of the Sun through space

6. **Which of the following statements are true (T) and which false (F) regarding radio waves and visible light?**

___ A. False Radio waves are a form of electromagnetic radiation, visible light is a pressure wave
___ B. True Radio waves travel the same speed as visible light (each in a vacuum)
___ C. False Radio waves have a shorter wavelength than visible light radiation
___ D. False Radio waves can travel through a vacuum, visible light requires an atmosphere to be transmitted

7. **What color is a yellow banana slug illuminated with blue light (check the correct answer)?**

___ A. Yellow
___ B. Green
___ C. Blue

___ D. Black

8. **Consider a 1-meter-radius solid copper sphere heated to 100C and a 1-meter-radius solid gold sphere heated to 100C. Label the following true (T) or false(F):**

___ A. False The copper sphere will produce radiation at shorter wavelengths (higher energies)
___ B. False The copper sphere will produce more total electromagnetic radiation
___ C. True The two spheres will produce identical continuous spectra
___ D. False The gold sphere will produce a distinctive emission-line spectrum

9. **Mercury's surface has a high density of impact craters. This is because (check any that are true).**

___ A. Mercury's surface is metallic and easily fractured

___ B. There is essentially no atmosphere on the Mercury

___ C. There is no volcanic or tectonic activity resurfacing Mercury
___ D. There is a much higher density of asteroid near Mercury because it is close to the Sun

10. **The emission-line spectrum of each element in gas state shows a unique pattern of wavelengths. Which of the following statements best states the underlying physical reason for that (check one)?**

___ Each element has a unique atomic weight
___ 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

___ Each element has a unique set of electron "allowed" orbital levels