

ASTR-2 Fall 2019: Quiz 1

1. What color is a yellow banana slug illuminated with green light (check the correct answer)?

- A. Yellow
- B. Green
- C. Blue
- D. Black

2. For a solid at 2900k at what wavelength is the peak of the Planck radiation curve?

$$T(K) = \frac{0.29}{\lambda_{\max}(cm)} \quad \text{so } \lambda_{\max}(cm) = 0.29/T(K) = 0.29/2900 \text{ cm}$$

3. 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 motion of the Sun through space
- D. The spin of the Earth on its axis

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.

- F The Sun would appear bluer at noon than it did at sunset
- F The color of the sky looking away from the Sun during the day would be white

5. What time does the full moon (~~phase where we can not see any part of the sunlit side~~) rise? Draw a picture to demonstrate your answer.

At Sunset



Sun



Earth



Moon

6. Use scientific notation to express the following numbers.

- A. $100 = 10^2$
- B. $0.0002 = 2 \times 10^{-4}$
- C. $1/1000 = 10^{-3}$
- D. $300,000 = 3 \times 10^5$

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

- A. Both are a form of electromagnetic radiation
- B. Radio waves travel at the same speed as visible light (each in a vacuum)
- C. Radio waves have a longer wavelength than visible light radiation
- D. Radio waves can travel through a vacuum, visible light requires an atmosphere to be transmitted

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. 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 identical emission-line spectra
- D. 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. There is essentially no atmosphere on the Mercury
- B. There is no volcanic or tectonic activity resurfacing Mercury
- C. There is a much higher density of asteroids near Mercury because it is close to the Sun
- D. Mercury's surface is metallic and easily fractured

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 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