

Chapter 2 Review Questions

MULTIPLE CHOICE: Choose the one alternative that best completes the statement or answers the question.

1. Suppose the albedo of a planet is measured to be 40 percent. This means that:
 - A) 60 percent of the Sun's energy is reflected.
 - B) 40 percent of the Sun's energy is absorbed.
 - C) 40 percent of the Sun's energy is reflected.
 - D) more energy is reflected than absorbed.
2. During the Earth's orbit around the Sun, the inclination (tilt) of the Earth's axis:
 - A) remains constant at 90 degrees.
 - B) varies from 0 to 23.5 degrees.
 - C) varies from 0 to 47 degrees.
 - D) remains constant at 23.5 degrees.
3. Low sun angles result in reduced solar energy because:
 - A) energy is spread over a larger area.
 - B) Sun-Earth distance is greater.
 - C) absorption is reduced.
 - D) day lengths are shorter.
4. Which of the following correctly describes the equinoxes?
 - A) The length of daylight at the Arctic and Antarctic Circle is 24 hours.
 - B) The Sun's vertical rays are striking either the Tropic of Cancer or the Tropic of Capricorn.
 - C) Days and nights are equal in length in all parts of the world.
 - D) They occur in June and December.
5. Flagstaff, AZ is at 35 degrees N latitude. What is the angle of the Sun's noon rays here on March 21?
 - A) 35 degrees
 - B) 55 degrees
 - C) 47 degrees
 - D) 0 degrees
6. At 45 degrees S latitude, the angle of the noon Sun is lowest and the length of daylight is shortest on:
 - A) December 21.
 - B) January 23.
 - C) June 21.
 - D) March 21.
 - E) September 22.
7. The first day of the *climatological* season of summer is:

- A) June 1.
 - B) June 21.
 - C) July 1.
 - D) July 4 (perihelion).
8. Which of the following associations is INCORRECT?
- A) aphelion – Earth farthest from the sun
 - B) vernal equinox – equal day/equal night
 - C) summer solstice – solar declination at the Tropic of Cancer
 - D) autumnal equinox – shortest day of the year for the Arctic Circle
9. The longest wavelengths on the electromagnetic spectrum are:
- A) gamma.
 - B) ultraviolet.
 - C) infrared.
 - D) radio.
 - E) visible light.
10. On the average, how much of the Sun's energy that is intercepted by the Earth system is reflected to space?
- A) 19 percent
 - B) 30 percent
 - C) 25 percent
 - D) 45 percent
 - E) 51 percent
11. The length of daylight gets progressively longer going south from the equator on:
- A) June 21
 - B) December 21
 - C) September 22
 - D) March 21
12. In meteorological terminology, the primary difference between *convection* and *advection* is:
- A) convection represents vertical heat transfer and advection represents horizontal heat transfer.
 - B) convection represents horizontal heat transfer and advection represents vertical heat transfer.
 - C) convection represents upper atmosphere heat transfer and advection represents surface heat transfer.
 - D) convection represents surface heat transfer and advection represents upper atmosphere heat transfer.
 - E) none of the above; the terms are used interchangeably.
13. At what time of year is the Earth's axis not tilted either toward or away from the Sun?

- A) autumnal equinox
- B) winter solstice
- C) summer solstice
- D) perihelion
- E) aphelion

14. During the spring equinox in the northern hemisphere, the *circle of illumination* passes directly through the:

- A) equator.
- B) Tropic of Capricorn.
- C) poles.
- D) Tropic of Cancer

15. The date that the Sun “sets” at the North Pole is:

- A) June 21.
- B) March 21.
- C) December 21.
- D) September 22.

16. The surface with the HIGHEST albedo is:

- A) fresh snow.
- B) grass.
- C) sand.
- D) water (Sun near zenith).
- E) thin cloud.

17. Wavelengths of the visible spectrum are between:

- A) 0.4 and 0.7 meters.
- B) 0.25 and 2.5 micrometers.
- C) 0.4 and 0.7 micrometers.
- D) 4 and 7 micrometers.

18. Objects with higher temperatures:

- A) emit only shortwave radiation.
- B) emit more shortwave radiation than cooler objects do.
- C) emit most of their energy in the form of longwave energy.
- D) radiate less total energy than cooler objects radiate.

19. The Earth emits terrestrial radiation:

- A) only over the continents.
- B) all the time.
- C) only at night.
- D) only during winter.

20. Earth is closest to the Sun during:

- A) Northern Hemisphere autumn.

- B) Southern Hemisphere autumn.
- C) Southern Hemisphere winter.
- D) Northern Hemisphere winter.
- E) Northern Hemisphere summer.