ESS5: The Atmosphere, Homeowrk #2 (due 4/17/2008)

Name_____

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

1) The solar constant:
   A) varies inversely with the fourth power of an object's distance from the Sun's surface.
   B) is higher for Earth than for Mars.
   C) is the same throughout the solar system.
   D) is independent of the Stefan–Boltzmann law.

   Answer: B

2) Convection:
   A) plays no significant role at night.
   B) typically transfers heat downward during the day.
   C) helps circulate heat throughout the atmosphere.
   D) is less important to making up the atmosphere's radiative energy deficit than is conduction.

   Answer: C

3) The sky is blue because:
   A) blue light is not easily absorbed by the atmosphere.
   B) blue light is reflected off the world's oceans into the atmosphere.
   C) blue light is not easily scattered by the atmosphere.
   D) air molecules scatter blue light more readily than other colors of visible light.

   Answer: D

4) This works primarily on shorter–wavelength radiation:
   A) Mie scattering.
   B) Rayleigh scattering.
   C) nonselective scattering.
   D) infrared absorption.

   Answer: B

5) The process by which solar energy interacts with the atmosphere is:
   A) scattering. B) reflection.
   C) absorption. D) all of the above

   Answer: D

6) Mie scattering:
   A) works best when there are few aerosols in the air.
   B) occurs often on hazy days.
   C) diminishes after volcanic eruptions.
   D) counters the reddening effect responsible for red sunsets and sunrises.

   Answer: B

7) Absorption:
   A) is typically greater in desert areas than in humid areas.
   B) is performed quite well by the atmosphere for visible wavelengths.
   C) does not prevent most ultraviolet light from reaching Earth's surface.
   D) is done to differing degrees by different gases.

   Answer: D

8) The sky is black on the Moon because:
   A) space reflects all wavelengths of radiation equally.
   B) the Moon does not have sufficient gravity to attract visible light.
   C) the Moon contains neither oceans nor vegetation.
   D) the Moon has no atmosphere.

   Answer: D

9) Wind systems are generated by:
A) the movements of ocean currents.
B) different pressures in different places.
C) the interaction of the atmosphere with the charged particles of the solar wind.
D) the drag on the atmosphere caused by the earth's rotation.

Answer: B

10) The atmospheric window:
A) is caused by the absence of certain gasses.
B) is a local phenomenon similar to the ozone hole that opens over Antarctica in winter.
C) allows certain wavelengths of longwave radiation to pass through the atmosphere.
D) is located at a band of wavelengths between 2 and 6 micrometers.

Answer: C

11) On average, the atmosphere absorbs roughly this percentage of the solar radiation that reaches the top of the atmosphere:
A) 25 percent. B) 14 percent.
C) 5 percent. D) 50 percent.

Answer: A

12) Net radiation is:
A) the sole cause of global warming.
B) radiation that is left over after a solar flare.
C) the solar energy that exceeds the solar constant.
D) defined as the difference between absorbed and emitted radiation.

Answer: D

13) Insolation reaching the surface of the earth:
A) is unaffected by Earth's albedo.
B) is absorbed by the earth.
C) represents about 50 percent of the amount that was at the top of the atmosphere.
D) has not yet been affected by backscattering.

Answer: C

14) The sky is blue because of:
A) mie scattering.
B) absorption.
C) rayleigh scattering.
D) reflection.
E) refraction.

Answer: C

Answer Key
Testname: HOMEWORK.2.TST

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

1) B
2) C
3) D
4) B
5) D
6) B
7) D
8) D
9) B
10) C
11) A
12) D
13) C
14) C