

1.    **The measure of the position of the sun from the horizontal is called the \_\_\_\_\_.**  
a. altitude                      b. azimuth                      c. declination                      d. zenith
  
2.    **The chemical formula for Pentane is:**  
a. CH<sub>4</sub>                      b. C<sub>2</sub> H<sub>6</sub>                      c. C<sub>5</sub> H<sub>12</sub>                      d. C<sub>8</sub> H<sub>18</sub>
  
3.    **The optimum angle of tilt (from the horizontal) for a flat plate collector at 35° N latitude for the purpose of space heating is \_\_\_\_\_.**  
a. 0°                      b. 25°                      c. 35°                      d. 45°
  
4.    **A Trombe wall in a house uses a large window and \_\_\_\_\_.**  
a. R-19 insulation in the walls  
b. a vertical thermal mass across the room from the window  
c. a vertical thermal mass close to the window  
d. a slate floor by the window
  
5.    **The use of thermal mass on a direct gain passive solar system \_\_\_\_\_.**  
a. reduces temperature fluctuations during the day.  
b. provides foundation support for the collector superstructure  
c. increases the insolation on the south-facing windows  
d. increases temperature fluctuations during the night
  
6.    **During which season will more insolation be delivered to a vertical south-facing window on a clear day?**  
a. winter                      b. fall                      c. spring                      d. summer
  
7.    **One advantage of using air as the working fluid in a solar collector is \_\_\_\_\_.**  
a. that freezing will not be a problem  
b. that water heats up faster than air  
c. a smaller storage facility can be used  
d. that one needs hot water for showers
  
8.    **Commonly used units for solar energy input are:**  
a. watts                      b. watts/day                      c. watts/day/m<sup>2</sup>                      d. Btu/ft<sup>2</sup>/day
  
9.    **Water circulates in a thermosiphon, hot water system because \_\_\_\_\_.**  
a. a pump is used  
b. gravity causes water to flow from the top of the collector to the bottom  
c. hot water is less dense than cold water  
d. solar energy is used to run the circulating pump

10. One can increase the insolation upon a one ft<sup>2</sup> horizontal plate by \_\_\_\_\_.
- using a fresnel lens of one ft<sup>2</sup>
  - using two 1 ft<sup>2</sup> fresnel lenses, one on top of the other
  - adding reflectors around the plate
  - increasing the temperature of the plate
11. Solar energy is quite compatible for a major part of the U.S. because our major energy needs are for \_\_\_\_\_ energy.
- electrical
  - thermal
  - kinetic
  - potential
12. An effective way to passively cool a house is to \_\_\_\_\_.
- open all the windows
  - use a light colored roofing material
  - use concentrating collectors to provide air conditioning
  - add more insulation on the south side of the house
13. P (*primary*) waves:
- travel only through solids
  - have a shearing or side to side motion
  - travel the slowest
  - travel thru any material
14. Conventional oil which is the lightest & has the highest quality, flowing from underground easily is:
- Proven
  - Peak oil
  - Proven Reserves
  - Bitumen
15. Natural gas consists of the following three:
- Ethane, Propane, & Butane
  - Methane, Pentane, & Octane
  - Ethane, Hexane, & Heptane
  - Butane, Octane, & Tetraethyl
16. The octane rating in gasoline is the fuel's ability to resist:
- impurities
  - detonation
  - pressure
  - noise in the carburetor
17. The most significant aspect of world consumption of energy over the last 40 years has been the \_\_\_\_\_.
- growth of nuclear power
  - expanding use of oil
  - increased use of coal
  - increase in our fossil fuel reserves

18. Which of the following statements is true (*only one*):
- The growth rate of energy consumption has kept pace with GNP growth.
  - Oil use has expanded more than any other fuel since 1940.
  - We reached the point last year where we imported no oil.
  - Electricity use has actually fallen since 1975.
19. A reaction in which energy flows into a system and thus increasing the potential energy of the system is:
- Esoteric
  - Exothermic
  - Endothermic
  - Allotropic
20. A reaction in which energy flows out of a system and thus decreasing the potential energy of the system is:
- Esoteric
  - Exothermic
  - Endothermic
  - Allotropic
21. Work done by a gas is an example of:
- Enthalpy
  - Compression
  - Expansion
  - State function
22. Work done to a gas is an example of:
- Enthalpy
  - Compression
  - Expansion
  - State function
23. Device that determines the heat associated with a chemical reaction is called:
- Capacitor
  - Resistor
  - Thermometer
  - Calorimeter
24. Carbon occurs on Earth in two allotropic forms, which are:
- Graphite; Charcoal
  - Graphite; Diamond
  - Graphite; Carbon Monoxide
  - Diamond; Carbon Dioxide
25. As coal matures through its four stages, the highest form is: \_\_\_\_\_ and the lowest form is: \_\_\_\_\_.
- Lignite; Anthracite
  - Sub-bituminous; Bituminous
  - Anthracite; Bituminous
  - Anthracite; Lignite