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Student Class

Section 3 – Understanding Heat and Temperature

3.1 Natural Sources of Thermal Energy

1. Much of the energy used in Alberta is found in the vast resources of fossil fuels. This type of energy source is useful and is stored until we need it. Fossil fuels are considered to be sources of ...
   A. chemical energy
   B. industrial energy
   C. biological energy
   D. geothermal energy

2. Solar energy is an excellent natural thermal energy source. This type of energy is produced inside of the Sun by ...
   A. biological processes
   B. nuclear reactions
   C. magnetic waves
   D. electric storms

3. There are two types of solar energy heating systems. The system using direct Sun rays is called …
   A. active
   B. activating
   C. positive
   D. passive

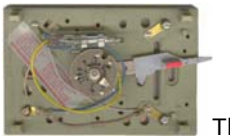
4. Thermal energy from inside the Earth's crust can be harnessed as a useful thermal energy source. Volcanoes, hot springs and geysers are example of this type of thermal energy source. This type of thermal energy is ...
   A. an environmental pollutant
   B. a clean alternative to using fossil fuels
   C. called geovolcanic energy
   D. used to generate fossil fuel resources

5. The thermal efficiency of a building's design can be measured by how well it prevents …
   A. heat gain
   B. heat loss
   C. direct sunlight
   D. convection currents

6. Solar collectors are used to capture the Sun's energy. These collectors are filled with ...
   A. coal
   B. water
   C. air
   D. glass

7. Solar cells are arranged in panels, which are connected in a series, and then placed to capture and store the Sun's energy in low voltage batteries. The panels are connected in a series to form what is called a solar ...
   A. system
   B. field
   C. array
   D. site

3.2 Heating Systems Technologies

1.  This illustration shows the inside workings of a thermostat.
The bimetallic strip, made of two different metals that expand and contract at different rates, enables the coil to act as a …
   A. element
   B. switch
   C. conductor
   D. insulator

2. Relative temperature for a comfortable room is maintained by using a thermostat, that is connected to a central heating system. The relative temperature of a comfortable room is …
   A. 18°C
   B. 20°C
   C. 37°C
   D. 100°C

3. Two types of heating systems in a house help to maintain heat flow where it is needed. The type of heating system that provides heat from a single, central source such as a furnace is called …
   A. local heating
   B. central heating
   C. boundary heating
   D. thermal heat control

4. Air that is heated by burning fuel in a furnace and then sent throughout the house through ducts to a register in every room is an example of this type of heating system …
   A. forced-air
   B. hot-water
   C. convection
   D. conventional

5. When a fireplace becomes too hot, this device - a moveable plate, that controls the flow of air to the fire - can be adjusted …
   A. cooler
   B. deflector
   C. airfoil
   D. damper

6. Thermal energy is needed to create the cold temperatures we need in technologies such as refrigerators, air-conditioners and freezers. Electricity or natural gas can provide the fuel that runs this device that the heart of these cooling technologies …
   A. fan
   B. motor
   C. compressor
   D. refrigerant

7. Basic parts of a cooling system are: a storage tank, a compressor, a freezer unit, condenser coils, and a …
   A. fan
   B. cooler
   C. evaporator
   D. refrigerant

3.3 Heat Loss and Insulation

1. A natural insulator helps to keep animals, such as polar bears and seals, warm in frigid water. This natural insulator forms a protective layer to help keep heat from leaving the body. This natural insulator is …
   A. skin
   B. fat
   C. hair
   D. fur

2. A material's ability to transfer heat by conduction is reflected by its thermal …
   A. capacity
   B. rating
   C. conductivity
   D. energy

3. Stone and brick are excellent insulators, but are not widely used because they are too expensive. The most common type of insulation that provides a layer of paneling between the outer walls and the siding is …
   A. plaster
   B. gyprock
   C. styrofoam
   D. fiberglass

4. In an average house heat is lost (transferred to the outside) in five major places. The least amount of heat is lost through the …
   A. walls
   B. windows
   C. through the floor
   D. gaps and poorly sealed areas

5. In an average house heat is lost (transferred to the outside) in five major places. The most amount of heat is lost through the …
   A. walls
   B. windows
   C. roof
   D. floors

6. To determine where heat is lost in a building, contractors can ask a photographer to take this type of photo of the house.
   A. A thermogram
   B. A radiogram
   C. A thermal negative
   D. An infogram

7. Insulators are rated by their insulating ability. R-value is given to each material that is used in the construction of a building. The best insulating product would have a …
   A. low R-value
   B. high R-value
   C. fractional R-value
   D. restricted R-value