

Chapter 2: Heating Load Estimates

TRUE/FALSE

1. The design heating load of a building is an estimate of the rate at which a building loses heat during the near minimum outdoor temperature.

ANS: T PTS: 1 REF: 22

2. One can assume that individual room heating loads are proportional to room floor area.

ANS: F PTS: 1 REF: 22

3. The R-value of a material is not directly proportional to its thickness.

ANS: F PTS: 1 REF: 24

4. Many residential and commercial buildings have concrete floor slabs rather than crawl spaces or full basements. Downward heat losses are relatively small from interior areas of the floor slab.

ANS: T PTS: 1 REF: 29-30

5. The U -value of any material or assembly is simply the reciprocal of the R-value of that material or assembly.

ANS: T PTS: 1 REF: 31

6. Heat is lost through all building surfaces that separate heated space from unheated space.

ANS: T PTS: 1 REF: 31

7. It is relatively easy to assess the location and magnitude of all the air leakage paths in a typical building.

ANS: F PTS: 1 REF: 32

8. The number of heating degree days that accumulate in a 24-hr. period is the difference between 72 F and the average outdoor air temperature during that period.

ANS: F PTS: 1 REF: 42-43

9. Knowing how many MMBtu a building requires over a typical heating season is not of much use to most owners.

ANS: T PTS: 1 REF: 45

10. A boiler, furnace, or small space heater operating on the same fuel, at the same assumed conversion efficiency, would produce the same estimated annual heating cost.

ANS: T PTS: 1 REF: 47

MULTIPLE CHOICE

1. The heating load is ____ of heat flow from the building to the outside air.
- a. a rate
 - b. the quantity
 - c. the cost
 - d. one unit

ANS: A PTS: 1 REF: 22

2. The proper approach is to perform a heat load calculation ____.
- a. factoring seasonal requirements
 - b. for each room
 - c. for the entire building
 - d. based on the owner's usage

ANS: B PTS: 1 REF: 22

3. An object's thermal ____ can be defined as its thickness in the direction of heat flow divided by its thermal conductivity.
- a. reactivity
 - b. reproduction
 - c. reciprocity
 - d. resistance

ANS: D PTS: 1 REF: 23

4. Heat flow from a basement or slab-on-grade foundation is determined by complex interactions between the building, the surrounding soil, insulation materials (if present), and the ____.
- a. depth of the foundation
 - b. orientation of the structure
 - c. air temperature above grade
 - d. planned usage of the room

ANS: C PTS: 1 REF: 26

5. All building surfaces that separate heated space from unheated space. (walls, windows, ceilings, doors, foundation, etc.) are called the ____ of the building.
- a. thermal envelope
 - b. heat load variables
 - c. resistance factors
 - d. thermal qualifiers

ANS: A PTS: 1 REF: 31-32

6. The *U*-value of any material or assembly is simply the reciprocal of the ____ of that material or assembly.
- a. heat load
 - b. temperature
 - c. exposure
 - d. *R*-value

ANS: D PTS: 1 REF: 31

7. In addition to conduction losses, heat is also carried out of buildings by uncontrolled air leakage. This is called ____ heat loss.
- a. anti-thermal
 - b. infiltration
 - c. insulation
 - d. environmental

ANS: B PTS: 1 REF: 32

8. One common method of factoring local weather conditions into estimates of heating energy use is based on heating ____.
- a. prognostication
 - b. thermometers
 - c. historical records
 - d. degree days

ANS: D PTS: 1 REF: 42

9. Once the ____ price of the fuel options has been calculated, a simple multiplication determines the estimated seasonal heating cost in dollars.
- a. effective
 - b. unit
 - c. advertised
 - d. estimated

ANS: B

PTS: 1

REF: 45

10. To estimate the annual space heating cost provided by an electrically operated heat pump, its average COP must be factored in. What does COP stand for?
- a. coefficient of performance
 - b. capacity of production
 - c. calculation of price
 - d. correlation of parts

ANS: A

PTS: 1

REF: 45