Skill Development Exercises for Chapter 3

3-1. The human body uses which of the following heat transfer mechanisms:
a) Radiation b) Convection c) Evaporation d) All of the above

Answer: d
Although convection and evaporation are the major mechanisms

3-2. The perception of comfort relates to:
a) Individual physical condition
b) Body heat exchange with the surroundings
c) Physiological characteristics d) All of the above e) None of the above

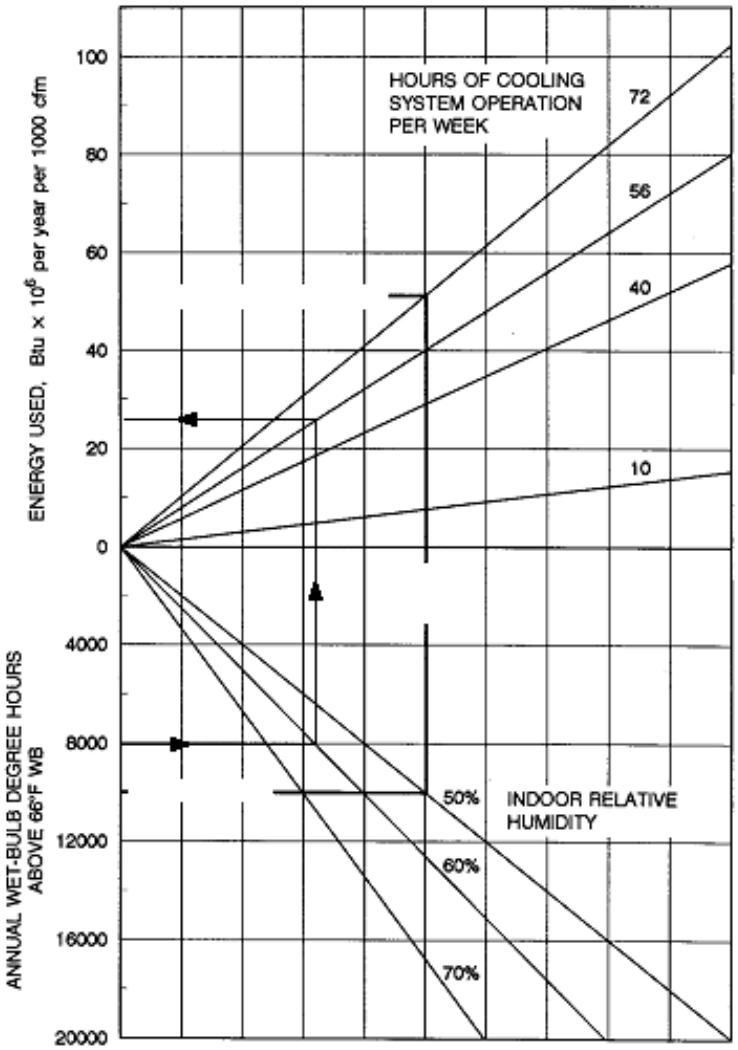
Answer: d

3-3. Which of the following would be within the acceptable range of temperature and humidity for human comfort when wearing light summer clothing?
a) 72°F, 20% rh b) 70°F, 65% rh c) 80°F, 30% rh d) All of the above

Answer: c, see Figure 3-2

3-4. In a system with 8,000 annual wet-bulb degree hours above 66°F, with a 60% indoor relative humidity desired, and 56 hours of cooling system operation per week, the energy used will be _____ Btu $\times 10^6$ per year per 1,000 cfm.
a) 51 b) 25 c) 36 d) None of the above

Answer: b
Enter the following diagram at 8000 annual wet-bulb degree hours and go across to the 60% line. Go vertically to the 56 cooling system operating hours per week and then left to the energy axis.



3-5. The _____ Procedure for determining the required ventilation rate is based on knowledge of the contaminants being generated within the space and the capability of the ventilation air supply to limit them to acceptable levels.

a) Indoor Air Quality b) Ventilation Rate c) Contaminant Mitigation

d) All of the above e) None of the above

Answer: a, Indoor Air Quality Procedure

The ventilation Rate Procedure provides prescriptive ventilation rates.

3-6. Many designers have adopted a minimum total supply air flow of _____ for office applications.

a) 0.1 to 0.3 cfm/ft^2 b) 0.6 to 0.8 cfm/ft^2 c) 0.2 to 2.0 cfm/ft^2
d) All of the above e) None of the above

Answer: b

3-7. The airstream velocity at the end of the throw is called:

a) Terminal velocity b) Primary velocity c) Airstream velocity
d) All of the above e) None of the above

Answer: a

3-8. _____ air distribution systems create relatively uniform air conditions in the occupied zone.

a) Unidirectional b) Local c) Mixing d) All of the above
e) None of the above

Answer: c

3-9. The stagnant region of a Group B mixing outlet in a heating only system is _____ the stagnant region of a Group A mixing outlet.

a) Larger than b) The same as c) Smaller than d) All of the above

Answer: c

3-10. In displacement systems, the outlets are frequently located:

a) At or near the floor level b) In the walls c) In the ceiling
d) A and B e) None of the above

Answer: d

Outlets are usually at or near floor level in the walls or false columns

3-11. Smudging is most likely to occur from dirt particles held in suspension in:

a) The room air b) The supply air c) The return air
d) All of the above e) None of the above

Answer: a

3-12. The fan horsepower for under-floor supply systems can often be less than required for a ceiling supply mixing system due to which of the following?

a) Much cooler supply air

b) The low resistance to air flow in the plenum

c) The insulating value of the floor and carpet

Answer: b

3-13. The under-floor supply systems work well for large open areas and the most effective control is a thermostat in the return duct. True or false?

a) True b) False

Answer: b, False

The air picks up heat from the lighting above the occupied zone, making the return duct thermostat location very unsatisfactory.