

## 15 INDOOR AIR QUALITY

### ANSWERS—QUIZ 1

1. a
2. a
3. b
4. a
5. d
6. c
7. a
8. Factors that have contributed to increased exposures to indoor air pollutants include the following:
  - construction of energy-efficient (tightly sealed) buildings
  - decreased ventilation rates to reduce energy costs
  - increased use of synthetic building materials, furnishings, pesticides, and housekeeping supplies
  - poor building design
  - improperly maintained building mechanical systems
  - occupant activities
9. Value-added benefits to implementing an IAQ management plan include:
  - demonstrated ongoing efforts to provide a safe indoor environment provide a strong legal and ethical position if problems do arise
  - quicker and more cost-effective response if problems occur
  - minimized adverse publicity
  - greater peace of mind for management and building occupants and physical plant and equipment
  - better comfort for occupants
10. Pollutant source(s), a driving force to move the pollutant(s), a pathway for the pollutant(s) to travel, and a susceptible population are the four elements that are common to IAQ problems.
11. IPM uses a combination of pest prevention, chemical pesticides, and nonchemical pest controls to control pests and minimize the hazard to people, property, and the environment.
12. Four common elements of an effective IAQ management plan are as follows:
  - designated primary point(s) of contact
  - timely communication of relevant issues to all

- affected parties
- written guidelines
- identification of potential problems and solutions

13. HEPA stands for high efficiency particulate air.
14. Stack effect is the flow of air that results from the phenomenon of rising warm air creating a positive pressure area at the top of a building and, subsequently, a negative pressure area at the bottom of a building. The stack effect can overpower the mechanical system and disrupt ventilation and circulation in a building. Stack effect exists whenever there is an indoor-outdoor temperature difference, and it becomes stronger as the temperature difference increases.

### ANSWERS—QUIZ 2

1. b
2. a
3. a
4. b
5. b
6. d
7. d
8. Factors that might contribute to complaints about indoor air quality include:
  - cigarette smoke
  - dust particles
  - objectionable odors
  - airborne compounds generated from a variety of sources
  - microbial contamination
  - poor air circulation
  - thermal comfort
  - humidity
  - job pressures
  - lighting
  - workstation design
  - noise
9. The condition of a building's indoor environment is based on complex interactions of the following factors:
  - occupant activities
  - the surrounding climate and weather
  - building structure and mechanical systems
  - contaminant sources

10. Common pollutant sources include the following:
  - occupant activities (e.g., housekeeping, maintenance, remodeling and renovation, and painting)
  - outside sources
  - building systems
  - equipment, furnishings, and wall and floor coverings
  
11. The following strategies are acceptable for controlling pollutants that contribute to poor IAQ:
  - manage pollutant sources either by removal, isolation, or controlling use
  - use ventilation to dilute and remove from the building
  - use filtration to clean the air
  
12. A body's cooling mechanism is based on the evaporation rate of perspiration. A high relative humidity reduces the evaporation rate of perspiration. As a result, the effect is similar to raising the temperature.

### **ANSWERS—CASE STUDY**

1. He shouldn't dismiss the tenants' complaints casually, but it is possible for those kinds of problems to be the result of:
  - illnesses contracted away from the workplace,
  - acute sensitivity (allergies),
  - stress, and
  - other psychosocial factors.
  
2. Professional help might be necessary or desirable in the following situations:
  - Mistakes or delays could have serious consequences (e.g., health hazards, liability exposure, regulatory sanctions, adverse publicity).
  - Building management feels that an independent investigation would be better received or more effectively documented than an in-house investigation.
  - Investigation and mitigation efforts by in-house staff have not relieved the IAQ problem.
  - Preliminary findings indicate the need for measurements that require specialized equipment or equipment and training beyond in-house capabilities.