

CHAPTER 1—HISTORICAL PERSPECTIVES

1. List the six reasons for preventing injuries and occupational illnesses as given in the text.
 - a. Needless destruction of life and health is morally unjustified.
 - b. Failure to take necessary precautions against predictable accidents and occupational illnesses makes management and workers morally responsible for those accidents and occupational illnesses.
 - c. Accidents and occupational illnesses severely limit efficiency and productivity.
 - d. Accidents and occupational illnesses produce far-reaching social harm.
 - e. The safety movement has demonstrated that its techniques are effective in reducing accident rates and promoting efficiency.
 - f. Recent state and federal legislation mandates management responsibility to provide a safe, healthful workplace.

2. With the industrial revolution came innovations in the processes and organization of production known as the factory system. List four components of the factory system that emerged at that time.
 - a. Substitution of mechanical energy for animal sources of power, particularly steam power through the combustion of coal
 - b. Substitution of machines for human skills and strength
 - c. Invention of new methods for transforming raw materials into finished goods, particularly in iron and steel production and industrial chemicals
 - d. Organization of work into large units, such as factories or forges or mills. This made possible direct supervision of the manufacturing process and an efficient division of labor.

3. What industry introduced the factory system in the United States?

c. textiles

4. Define the fellow servant rule.

The employer is not liable for an injury to an employee that results from negligence of a fellow employee.

5. Define contributory negligence.

The employer is not liable if an employee is injured due to his own negligence.

6. Define assumption of risk

The employer is not liable because the employee took the job with full knowledge of the risks and hazards involved.

7. Which president's legislation set up the first workers' compensation laws covering only federal employees?

a. Theodore Roosevelt

8. Which state passed the first effective workers' compensation act?

b. Wisconsin

9. What industry was the first to realize that the actions of people are important in creating unintentional-injury situations?

b. railroads

10. When was the National Safety Council started?

c. 1912

11. What is the "Three Es of Safety" concept?

As industry developed some experience in safety, it discovered that engineering could prevent unintentional injuries, that *employees* could be reached through *education*, and that safety rules could be established and *enforced*.

12. List the three trends in safety work and the safety profession that have emerged from the prevention and control measure concepts of the 1950s.

- a. First, more emphasis is being placed on analyzing the loss potential of any organization or projected activity.
- b. Second, industry is developing more factual, unbiased, and objective information about loss-producing problems and accident causation to help those who are ultimately responsible for worker health and safety make sound decisions.
- c. Third, management is making greater use of the safety and health professional's knowledge and assistance in developing safe products.

13. List the necessary elements for a joint safety and health activity to be successful in any workplace.

- a. A sincere commitment to the safety and health effort must be displayed by both labor and management leaders in the workplace.
- b. Specific roles and responsibilities should be defined for all committee members.

- c. An effective communication link with feedback to workers from committee members must be established between the committee members and all employees in the workplace.
- d. Measurable, realistic goals and objectives should be established for committee activity.
14. Regarding safety matters in the United States, which act regulates companies with government contracts?
- a. Walsh-Healy Act
15. Which items were included in the national safety law brought about by the Williams-Steiger Occupational Safety and Health Act?
- a. one or more employees
- b. businesses affected by interstate commerce
16. List four factors that have spurred the drive for international standardization of health and safety regulations.
- a. Emerging global markets have intensified the need for international standardization.
- b. Worldwide technological innovations result in changes to industrial methods and organizations that threaten worker and consumer safety.
- c. The rapid pace of change in science and technology is outstripping standards development in most countries.
- d. Developing countries' efforts to industrialize means they may downplay safety and health regulations in favor of rapid economic growth.
17. List five employer obligations relating to the safety and health of workers stated in the Framework Directive (89/391/EEC) of ISO 9000 and ISO 14000.
- a. Taking the measures necessary for their safety and health, bearing in mind technical progress
- b. Evaluating hazards and instructing workers accordingly
- c. Setting up protection and prevention services—for example, the provision of safety and health practitioners— within the workplace, possibly by enlisting competent external services or persons
- d. Organization of first aid
- e. Evacuation of workers in the event of serious damage.
18. List three employee obligations relating to the safety and health of workers stated in the Framework Directive (89/391/EEC) of ISO 9000 and ISO 14000.
- a. Correct use of machinery
- b. Correct use of protective equipment
- c. The need to report defects in equipment, defects in procedures, and potentially dangerous situations, such as near-miss accidents.
19. What were the purpose and significance of the death calendar used by the Russell Sage Foundation in Allegheny County, Pennsylvania?
- The death calendar made it clear that the accident and death rate was serious, and it gave the safety movement a much-needed boost.
20. What contributed to the lowering of the overall occupational death rate in the United States since World War II?
- Since World War II, the growth of safety procedures and policies intensified, particularly as the federal government began encouraging its contractors to adopt safe work practices.
21. Explain why an independent union safety and health committee can be important.
- It allows representatives of the union to meet and consider the safety of the workplace, without any interference from management.
 - It gives the union its own forum to discuss and set priorities and strategies for dealing with workplace hazards.
 - It allows the committee members to gain appropriate expertise in researching hazards and seeking effective solutions. (Note that there is an important difference between gaining expertise and becoming an expert.)
 - It can be used to monitor the performance of a joint union-management committee, if one exists.
 - If a joint committee runs into roadblocks or becomes ineffective and the union side withdraws, the union will already have a structure for handling safety and health concerns.
22. What guidelines should both labor and management consider when establishing a joint safety and health committee at a workplace?
- A sincere commitment to the safety and health effort must be displayed by both labor and management leaders in the workplace.
 - Specific roles and responsibilities should be defined for all committee members.
 - An effective communication link must be established between the committee members and all employees in the workplace. This includes feedback to workers from committee members.
 - Measurable, realistic goals and objectives should be established for committee activity.

23. Discuss the major safety and health issues management must address.

Management must address serious emerging issues in worker health and safety law. These issues include off-the-job safety and ways to deal with the special problem of employees who are at risk in the work environment because of physical condition, language problems, or particular susceptibility to injury or disease. Another issue is the burgeoning paperwork required to comply with OSHA and other agency record-keeping regulations, with the Medical Access Standard, and with the Hazard Communication Standard. Industry accepts almost without question the concept of financial responsibility for work injuries. Not all of industry, however, is convinced of the cost effectiveness of government regulation of safety procedures.

CHAPTER 2—THE SAFETY, HEALTH, AND ENVIRONMENTAL PROFESSIONAL

1. List the four major roles of the safety, health, and environmental professional.
 - a. Identification and appraisal of incident- and loss-producing conditions and practices and evaluation of the severity of the incident problem.
 - b. Development of incident-prevention and loss-control methods, procedures, and programs.
 - c. Communication of incident- and loss-control information to those directly involved.
 - d. Measurement and evaluation of the effectiveness of the incident- and loss-control system and the modifications needed to achieve optimum results.

2. What ethical code or guide should the SH&E professional adopt?

“First, ensure reasonable protection for the health of individuals.”

3. List two ways in which globalization affects the SH&E professional.
 - a. increasing the impact of global standards
 - b. increasing public concern that the workers in developing countries who make products for the U.S. market will be provided safe working conditions.
4. What four benefits can the SH&E professional use to sell safety to management?
 - a. establishing public trust
 - b. reducing costs
 - c. retaining good workers
 - d. increasing productivity.

5. What is the SH&E professional’s personal and professional liability for errors and omissions?

Lawsuits against corporations do not usually include claims against the individual employees who acted for the company. Most corporate systems include provisions that indemnify or pay the costs of defense of employees who are sued when performing their assigned duties. In the event that an individual safety, health, and environmental manager is sued, the employer will probably pay the legal expenses to have the individual suit dropped. Where the safety, health, and environmental professional is acting as a consultant, the vulnerability to lawsuits is a constant cost of doing business. An adequate insurance policy for professional “errors and omissions” should be maintained. The consultant upon whose advice a company relies has a possible vulnerability for

professional negligence if he or she does not meet the normal standard of care for similar advisors within that area or subject of expertise.

6. Discuss five future opportunities a SH&E professional can expect.
 - a. Opportunity to expand knowledge of potential hazards of new technology.
 - b. Opportunity to respond quickly to newly identified risk issues to maximize worker protections.
 - c. Opportunity to apply experience and knowledge of human-machine interactions to new product development in a product stewardship role.
 - d. Opportunity to be diplomatic, creative, and date-focused about indoor air quality issues.
 - e. Opportunity to shift focus to more subtle, more difficult to manage, tailored protection of health and safety.

CHAPTER 3—SAFETY CULTURE

1. List the four basic characteristics of a successful safety culture that would align well with the generative culture.
 - a. reporting culture
 - b. just culture
 - c. flexible culture
 - d. learning culture.
2. List the four levels of an organization's cultural change.
 - a. Level 1—shaping and anticipating the future
 - b. Level 2—defining what businesses to be in and the competencies of each
 - c. Level 3—structurally changing or reengineering processes
 - d. Level 4—incrementally improving the processes.
3. When planning a safety survey, what are five key items to keep in mind?

Any of the following:

 - a. Keep the data anonymous, and report back only at the aggregated level.
 - b. Decide before surveying how to analyze the data so that the proper demographic data for stratification can be included.
 - c. Survey response rates will be highest—about 80% to 90%—if the survey is proctored by an outside party and taken on company time; survey rates via the Web usually yield about a 50% return rate; surveys mailed to homes usually yield a 20% to 30% return rate.
 - d. Involve influential employees in the survey effort.
 - e. Have management communicate the purpose and anonymity of the survey.
 - f. Use survey tools that are psychometrically sound and have good reliability and validity.
 - g. Never survey without subsequently providing feedback and modifications based on the results.
4. Chaudron (2003) suggests that organizations need to go through a formal decision-making process that has what four major components?
 - a. levels, goals, and strategies
 - b. measurement systems
 - c. basic options
 - d. implementation and organizational change.
5. What are four of the six ways that managers can change the culture?
 - a. what they pay attention to, measure, and control on a regular basis
 - b. how they react to critical incidents
 - c. how they allocate scarce resources
 - d. how they role-model, teach, and coach
 - e. how they allocate rewards and plentiful resources
 - f. how they recruit and select new employees.
6. The well-researched benefits of a behavior-based process (BBS) include:
 - a. providing a system to measure upstream indicators of safe behaviors and a platform to give individual feedback on safety performance
 - b. influencing the development of a safe work culture in which everyone accepts responsibility for safety and does something about it on a daily basis
 - c. developing a methodology for safe work practices that is supported by reinforcing feedback from peers, managers, and members of the safety team
 - d. establishing a culture where employees go beyond the call of duty and identify unsafe conditions and employee at-risk behaviors and intervene to correct them
 - e. developing a foundation of positive recognition of safe behaviors
 - f. developing a system for identifying the root causes of unsafe behavior and the barriers to safe behavior in the existing management system
 - g. developing an employee involvement mechanism that encourages employee input and participation and contributes to the overall safety process
 - h. integrating seamlessly with the current systems for problem identification, problem solving, and continuous improvement
 - i. identifying and addressing the common pathway for injuries occurring at the facility
 - j. identifying and correcting system-related issues that can compel at-risk behaviors to occur.
7. The 10 Safety Culture Maturity Model elements espoused by Fleming include:
 - a. management commitment and visibility
 - b. communication
 - c. productivity versus safety
 - d. learning organization
 - e. safety resources
 - f. participation
 - g. shared perceptions about safety
 - h. trust
 - i. industrial relations and job satisfaction
 - j. training.

8. Define *safety culture*.

Safety culture includes the underlying assumptions, values, norms, and expectations of an organization. Researchers agree that culture is a valid measure for assessing organizations and making improvements (Cooke and Rousseau 1988; Schein 1984; Schneider 1990). However, culture cannot be easily measured nor easily interpreted.

9. Define *safety climate*.

Safety climate is a reflection of culture, and is often assessed by gathering information through questionnaires or surveys that provide a snapshot of individual perceptions, attitudes, and beliefs (Sarkus 2001). Safety climate focuses on individual perceptions related to the work environment.

CHAPTER 4—REGULATORY HISTORY

1. What is the purpose of the Williams-Steiger Act (OSH Act)?

The purpose is “to assure so far as possible every working man and woman in the Nation safe and healthful working conditions and to preserve our human resources.”

2. Before the passage of the OSH Act, other pieces of national safety legislation had been passed in the United States; what was the main drawback of these pieces of legislation?

The other legislation was applicable to only a limited number of employers.

3. Labor was a strong proponent of giving the federal government a more significant role in occupational safety and health. On what is this position based?

- In general, states had inadequate safety and health standards, inadequate enforcement procedures, inadequate staff with respect to quality and quantity, and inadequate budgets.
- In the late 1960s, approximately 14,300 were killed annually on or in connection with their job and more than 2.2 million employees suffered a disabling injury each year as a result of work-related accidents. The injury/death toll was considered by most to be unacceptably high.
- The nation’s work-injury rates in most industries were increasing throughout the 1960s. Because the trend was moving in the wrong direction, proponents of federal intervention felt that national legislation would help to reverse this trend.

4. List the two organizations that are vested with the administration and enforcement of the OSH Act.

- a. Secretary of Labor, the Assistant Secretary of Labor for OSHA
- b. Occupational Safety and Health Review Commission (OSHRC), as an appellate agency.

5. Name the quasi-judicial board of three members appointed by the president and confirmed by the Senate to adjudicate cases.

Occupational Safety & Health Review Commission

6. What are the primary functions of NIOSH?

- a. to develop and establish recommended occupational safety and health standards

- b. to conduct research experiments and demonstrations related to occupational safety and health
- c. to develop educational programs to provide an adequate supply of qualified personnel to carry out the purposes of the OSH Act.

7. List the five main technical services provided by NIOSH.

- a. hazard evaluation
- b. technical information
- c. incident prevention
- d. industrial hygiene
- e. medical service

8. The final responsibility for compliance rests with the employer.

9. What are the three voluntary safety programs established by OSHA for companies with exceptional safety programs?

- a. Star program for most fully compliant sites
- b. Merit program for sites that aspire to achieve Star status
- c. Demonstration Project program for sites that demonstrate alternate means of compliance.

10. In what publication are possible federal safety standards published before they are brought up for formal consideration to be enacted into law?

Federal Register

11. What two types of variances can OSHA grant?

- a. temporary
- b. permanent

12. Employers must report to OSHA within 8 hours after an unintentional injury occurs that is fatal to one or more employees or that results in the inpatient hospitalization of three or more employees.

13. Are compliance safety and health officers (CSHOs) required to present solutions or methods of correcting, minimizing, or eliminating a violation?

No, it is not required, but it is often suggested that CSHOs present solutions.

14. List the five categories of violations.

- a. willful
- b. serious
- c. repeat
- d. other than serious
- e. de minimis (very minor)

15. What four steps must a CSHO take to determine that a violation is serious?

- a. Step 1—the type of accident or health hazard exposure which the violated standard or the general duty clause is designed to prevent
- b. Step 2—the type of injury or illness which could reasonably be expected to result from the type of accident or health hazard exposure identified in Step 1
- c. Step 3—whether the types of injury or illness identified in Step 2 could include death or a form of serious physical harm.
- d. Step 4—whether the employer knew, or with the exercise of reasonable diligence, could have known of the presence of the hazardous condition.

16. How many an employer contest a violation?

Within 15 working days after an employer receives a citation, an employer may submit a written objection to the citation to OSHA. The OSHA Area Director then forwards the objection to OSHRC. Employees may request an informal conference with OSHA to discuss any issues raised by an inspection, citation, notice of proposed penalty, or employer’s notice of intention to contest.

17. How long should employee medical records be retained by employers?

30 years from the termination date of the employee

18. What is the basic purpose of the hazard communication standard?

The basic purpose of the Hazard Communication Standard is to inform employees about the risks, precautions, and safe use of substances.

19. What does the quality of a hazard communication program depend on?

The quality of a hazard communication program depends on the accuracy of the initial hazard assessment.

20. Who is responsible for the information on MSDSs?

Employers are responsible for providing information for SDSs (formerly MSDSs) and must ensure that all sheets are up to date.

21. Whom does the OSH Act cover, and who is excluded from its coverage?

With some exceptions, the OSH Act applies to employers in all 50 states and U.S. possessions that have one or more employees and that are engaged in a business affecting commerce. Specifically excluded from coverage are all federal, state, and local government employees.

22. What are the general duties of employers and employees under the OSH Act?

Employers have the general duty to furnish each employee with employment and places of employment free from recognized hazards causing or likely to cause death or serious physical harm and the specific duty of complying with safety and health standards promulgated under the OSH Act. Each employee has the duty to comply with the safety and health standards and with all rules, regulations, and orders that apply to employee actions and conduct on the job.

23. What is the purpose of the OSHA Voluntary Protection Programs?

The purpose of the OSHA Voluntary Protection Programs is to emphasize the importance of, encourage the improvement of, and recognize excellence in employer-provided, site-specific occupational safety and health programs.

24. What concepts must an organization have present to qualify as having an exemplary safety program?

To qualify as exemplary, an organization must have management commitment and accountability, hazard assessment, safety rules and enforcement, employee training, and self-evaluation.

25. What does the informal conference provide regarding a citation?

Both the employer and employee representatives are afforded the opportunity to participate fully and discuss the issues raised.

26. How does a state go about having a “state OSHA plan” approved?

State plans are submitted, reviewed, published for public comment, and adopted under OSHA regulations. The regulations pertaining to state plans for the development and enforcement of state standards are codified in Title 29 CFR, Chapter XVII, Part 1902. The basic criterion for approval of state plans is that the plan must be at least as effective as the federal program.

27. How has the OSH Act given new visibility to occupational safety and health?

The OSH Act has given employees a significant role to play in occupational safety and health matters. It has raised occupational safety and health issues to a higher priority in business management. It has given new status and responsibility to professionals working in the occupational safety and health field. And, the act has bestowed a new status to nationally recognized organizations that develop industry standards. The OSH Act has encouraged greater training for professionals in occupational safety and health. The OSH Act also gave new emphasis to the product safety discipline.

CHAPTER 5—LEGAL AND REGULATORY ISSUES FOR THE SAFETY MANAGER

1. List the five top-cited OSHA workplace violations.

- a. fall protection
- b. hazard communication
- c. scaffolding
- d. respiratory protection
- e. electrical and wiring methods

2. For a company to be cited using the general-duty clause, name the criteria that must exist.

- a. There is no applicable OSHA standard for an identified hazard.
- b. The employer failed to keep the workplace free of a hazard to which employees of that employer were exposed.
- c. The hazard was recognized or should have been recognized.
- d. The hazard was causing or was likely to cause death or serious physical harm.
- e. There was a feasible and useful method to correct the hazard.

3. What is the definition of a confined space?

A *confined space* is characterized by restricted means of entry/exit, size sufficient to contain a worker, and not specifically designed for worker occupancy. A confined space also has limited or restricted means for entry or exit and is not designed for continuous occupancy.

4. What is the definition of a permit-required confined space?

A *permit-required confined space* (permit space) is a confined space that has one or more of the following characteristics: contains, or has the potential to contain, a hazardous atmosphere; contains a material that has the potential to engulf an entrant; has walls that converge inward or floors that slope downward and taper into a smaller area that could trap or asphyxiate an entrant; or contains any other recognized safety or health hazard, such as unguarded machinery, exposed live wires, or heat stress.

5. When recording information on the OSHA 300 Log or the 301 Injury and Illness Incident Report forms, how is a routine job function defined?

A *routine job function* is defined as work activities the employee regularly performs at least once per week.

6. Name three regulations that require written programs.

- a. 29 CFR 1910.1030(c)(1)(i) and 1910.1030(c)(1)(iii) (bloodborne pathogens)
- b. 29 CFR 1910.1200(e)(1) and 1910.1200(e)(4) (hazard communication),
- c. 29 CFR 1910.146(c)(4) (permit-required confined spaces).

7. What are the recent changes to labeling under the Hazard Communication Standard, 29 CFR 1910.1200?

As of June 1, 2015, all labels are required to have pictograms, a signal word, hazard and precautionary statements, the product identifier, and supplier identification.

8. True or False: OSHA has extended the ground-fault protection requirement to temporary receptacles used in construction activities performed in general industry.

True

CHAPTER 6—LOSS CONTROL PROGRAMS

1. Give three of the five benefits of hazard analysis.
 - a. It forces the conductors of the analysis to view each operation as a part of a system.
 - b. It identifies hazardous conditions and potential accidents.
 - c. It provides information so effective control measures can be established.
 - d. It can determine the level of knowledge, skill, and physical requirements workers need to perform specific tasks.
 - e. It can discover and eliminate unsafe procedures, techniques, motions, positions, and actions.

2. What is the purpose of ranking hazards by risk?

The purpose of ranking hazards by risk is to figure out which hazards are the worst. By doing so, a consistent guide for corrective action will be established. The ranking will specify which hazardous conditions warrant immediate action, which have secondary priority, and which ones can be addressed in the future.

3. What types of negligence liability does a company assume when it takes on a contractor role inside a workplace, such as by repairing equipment or providing specialized mechanical services?

Once a vendor takes on a responsibility within a work place, the vendor is legally accountable for harm caused by its negligence, and the vendor can be sued either by the facility owner or by the worker who is injured. Types of negligence include the usual mistakes that allow accidental injuries; omissions of care that should have been taken such as loading containers properly; and negligence that results from the violation of an applicable law or rule.

4. When can injured workers sue their employees?

The employer responsible for an injury may, in extreme cases, face lawsuits by injured workers or their families, asserting that the danger was so severe and obvious that the company intended that workers be vulnerable to injury. These *intentional tort* cases are an exception to workers' compensation in states where they have been allowed.

5. What federal government programs regulate workplace safety?

Workplace safety is predominantly regulated by the Labor Department's Occupational Safety and Health Administration (OSHA) and the several states that administer OSHA "state plans." Other federal programs include the Mine Safety and Health Administration,

Environmental Protection Agency (EPA), Department of Transportation (DOT), Federal Aviation Administration (FAA), Consumer Product Safety Commission (CPSC), Nuclear Regulatory Commission, and Food and Drug Administration (FDA).

6. Is proof of the manager's knowledge of the action necessary when the action violates a law with "strict liability" penalty provisions?

no

7. What extra risks do government contractors face from violations of federal safety rules?

The contract can be cancelled; the individual can be debarred from any future involvement with government contracts; and the company or organization can be disqualified from bidding on any future government contracts.

8. Name the three major areas where hazardous conditions can be either eliminated or controlled, and give an example of each.

- a. at the source (substitute a less harmful agent for the one causing the problem, e.g., toxic to nontoxic, flammable to nonflammable)
- b. along its path (e.g., install machine guards to prevent unwanted contact by workers; put up protective curtains to prevent sparks and welding arc flash; install an exhaust system to remove toxic vapors from breathing zones of workers)
- c. at the worker (e.g., employ automated or remote control options; provide a system of worker rotation or reschedule operations when there are few workers in the plant; provide personal protective equipment).

CHAPTER 7—SAFETY, HEALTH, AND ENVIRONMENTAL AUDITING

1. Briefly define safety, health, and environmental (SH&E) auditing.

SH&E auditing is a methodical examination of a facility's procedures and practices that verifies whether they comply with legal requirements and internal policies and evaluates whether they conform to good safety, health, and environmental practices.

2. List six of the nine company objectives in establishing SH&E auditing programs.
 - a. To determine and document compliance status
 - b. To improve overall safety, health, and environmental performance at operating facilities
 - c. To assess facility management
 - d. To increase the overall level of safety, health, and environmental awareness
 - e. To accelerate the overall development of S/H/E management control systems
 - f. To improve the safety, health, and environmental risk management system
 - g. To protect the company from potential liabilities
 - h. To develop a basis for optimizing safety, health, and environmental resources
 - i. To assess facility management's ability to achieve S/H/E goals.
3. Name and briefly discuss the six criteria companies can use to define the scope and focus of an audit.
 - a. Organizational boundaries—address which of the company's operations are included in the auditing program, such as manufacturing, R & D, and distribution.
 - b. Geographical boundaries—address how far or wide the program applies, such as state, province, regional, national, or international.
 - c. Locational boundaries—address what territory is included in an audit, such as activities within the facility boundary, off-site manufacturing or packaging, off-site waste disposal, local residences, and a nearby river or lake if there is a potential for environmental damage.
 - d. Functional areas—define which subject areas are included, such as air and water pollution control, solid and hazardous waste management, employee safety, industrial hygiene, occupational medicine, fire and loss prevention, process safety, and product safety.
 - e. Media audits examine a specific medium, such as water or air. These are often developed in response to comprehensive audits and can be scheduled to occur more often and in a shorter time span than a full audit.

- f. Compliance boundaries—define the standards against which the facility is measured, such as federal, provincial, regional, and local laws and regulations; corporate or division policies, procedures, standards, and guidelines; local facility operating procedures; or standards established by an outside group.

4. What are the seven key steps in the SH&E auditing process?
 - a. Audit planning
 - b. Understand management systems
 - c. Assess internal controls
 - d. Gather audit evidence
 - e. Evaluate audit evidence
 - f. Report audit findings
 - g. Audit follow-up
5. List the two basic audit tools, and explain why each one is so important.
 - a. Audit protocols—represent plans of how the auditor is to accomplish the objectives of the audit. They list the audit procedures that are to be performed to gain evidence about safety, health, and environmental practices. They also provide the basis for assigning specific tasks to individual members of the audit team, for comparing what was accomplished with what was planned, and for summarizing and recording the work accomplished. When well-designed, audit protocols can be used to train inexperienced auditors and reduce the amount of supervision required by the audit team leader, as well as help build consistency into the audit.
 - b. Working papers—document the work performed, the techniques used, and the conclusions reached by the auditors. These papers help the auditor achieve the audit objectives and provide reasonable assurance that an adequate audit was performed consistent with audit program goals. Working-papers should include documentation of compliance or noncompliance.
6. Which department of a company is usually involved in the initial development of the audit program and plays a central role in developing the audit reporting process?
 - c. legal department
7. In staffing their audit program team, companies should choose which combination of individuals?
 - d. varies from company to company

8. As companies expand their auditing programs overseas, what types of considerations will they have to address?
- e. all of the above
9. List five of the seven trends that will be seen in audit programs over the next 5 years.
- a. Increased growth
 - b. Broader scope
 - c. Increased rigor and depth of review
 - d. Increased effectiveness of field resources
 - e. Increased emphasis on basic skills
 - f. Expanded nature of reporting
 - g. Emergence of S/H/E auditing standards

CHAPTER 8—WORKERS' COMPENSATION

1. Name two types of economic losses that workers and their families experience when workers are injured at work.

- a. Loss of earnings
- b. Additional expenses

2. How can an effective loss control program benefit the entire economy?

An effective loss control program benefits the entire economy by assisting in keeping workers from being injured on the job, and by reducing direct losses to the worker and the worker's family. In addition, an effective loss control program will mitigate society's losses from taxes that the injured worker would have paid, products they would have purchased, and public assistance benefits the family may have needed.

3. The Federal Employees' Compensation Act covers all employees of the U.S. government. Which act covers the maritime workers?

The Longshoremen and Harbor Workers' Compensation Act

4. Name the six basic objectives underlying workers' compensation laws.

- a. Provide adequate, equitable, prompt, and sure income and medical benefits to work-related accident victims, or income benefits to their dependents, regardless of fault.
- b. Provide a single remedy and reduce court delays, costs, and workloads arising of the personal-injury litigation.
- c. Relieve public and private charities of financial drains due to uncompensated industrial accidents.
- d. Eliminate payment of fees to attorneys and witnesses as well as time-consuming trials and appeals.
- e. Encourage maximum employer interest in safety and rehabilitation through an appropriate experience-rating mechanism.
- f. Promote frank study of accident causes and not faults, reducing preventable accidents and human suffering.

5. What does a compulsory law require?

A compulsory law requires each employer to accept the provisions and provide for specific benefits, i.e. required compliance with the law.

6. Under the quid pro quo of workers' compensation law, what were employers required to accept?

Under quid pro quo of workers' compensation law, employers were required to accept responsibility for injuries arising out of and in the course of employment without regard to fault.

7. What two concepts are broadening the exclusive remedy provision?

- a. Expansion of the dual capacity doctrine
- b. The international tort exception

8. What are the three types of workers' compensation benefits?

- a. Loss of income
- b. Medical payments
- c. Rehabilitation

9. What is the minimum percentage of disability wages that injured workers usually receive?

66 percent

10. What two types of workers are excluded from workers' compensation?

- a. Workers in farming, domestic service, casual employment, charitable or religious organizations.
- b. Employees covered under other types of compensation, such as FECA, Jones Act, and FELA.

11. Name the four degrees of worker disability.

- a. Temporary total
- b. Permanent total
- c. Permanent partial
- d. Temporary partial

12. The goal of workers' compensation is to replace the wages lost by workers who are disabled due to job-related injury or illness.

13. What goals does a company hope to achieve through its workers' compensation program?

- a. To prevent accidents
- b. To control costs
- c. To respond to accidents promptly and efficiently.

14. What federal act provides a major source of funding for the retraining and rehabilitating of workers?

The Federal Vocational Rehabilitation Act

15. What are two factors that prompt compensation litigation?
- Uncertainty about whether an accident arose out of and in the course of employment
 - The extent of the disability

16. What is vocational rehabilitation, and when is it necessary?

Vocational rehabilitation prepares the injured worker for a new occupation or for ways of continuing in an old one. Vocational rehabilitation is assigned when medical treatment fails to restore the worker to the job held when the individual was injured.

17. Which three theories are used to help determine the degree of a worker's impairment and the worker's remaining capacity to find employment?
- Whole-person
 - Wage-loss
 - Loss of wage-earning capacity

18. When can employees sue the employer regardless of the exclusive remedy doctrine?
- Expansion of the dual doctrine—injury resulted from the employer's product that is available to consumers.
 - Employer commits an international tort

CHAPTER 9—IDENTIFYING HAZARDS

1. Define *hazard analysis*.

Hazard analysis is an analysis performed to identify and evaluate hazards in order to eliminate or control them.

2. List two formal methods of hazard analysis.

inductive method; deductive method

3. In determining which hazard analysis approach to use for a given situation, the hazard control specialist will need to answer which five questions?

- What is the quantity and quality of information desired?
- What information already is available?
- What is the cost of setting up and conducting analyses?
- How much time is available before decisions must be made and action taken?
- How many people are available to assist in the hazard analysis, and what are their qualifications?

4. In order to decide which processes, operations, and tasks receive priority, what are the five factors that need to be analyzed?

- Frequency of accidents
- Potential for injury
- Severity of injury
- New jobs, or altered equipment, processes, and operations
- Excessive material waste or damage to equipment.

5. Define *job safety analysis* (JSA).

Job safety analysis (JSA) is a procedure used to review job methods and uncover hazards that (1) may have been overlooked in the layout of the facility or building and in the design of the machinery, equipment, tools, workstations, and processes; (2) may have developed after production started; or (3) resulted from changes in work procedures or personnel.

6. After the job has been selected to be analyzed, what are three basic steps in conducting a JSA?

- Break the job down into successive steps or activities and observe how these actions are performed.
- Identify the hazards and potential injuries.
- Develop safe job procedures to eliminate the hazards and prevent the potential injuries.

7. Inspecting is the first stage of the hazard and incident analysis procedure. What is the general purpose of an inspection?

The primary purpose of inspection is to detect potential hazards so they can be corrected before an unintentional injury or illness occurs.

8. List and briefly explain two types of inspections.

- Continuous inspections—informal inspections that do not conform to a set schedule, plan, or checklist, and are conducted by employees, supervisors, and maintenance personnel as part of their job responsibilities
- Interval inspections—planned inspections at specific intervals that are deliberate, thorough, and systematic, and are conducted by safety professionals, certified or licensed inspectors, outside investigators, and government inspectors

9. The toolroom employee examines all tools before sending them out to be used. What is this type of inspection called?

- continuous

10. Gathering information about standards, regulations, and codes is the first step in determining what items need to be inspected. What sources of information are available to assist in this process?

Monitoring checklists are useful in identifying which standards and regulations apply. The Centers for Disease Control of the U.S. Department of Health and Human Services (DHHS) have a suggested checklist, and the National Safety Council's website has sample checklists from various companies.

11. List four factors that determine the frequency of inspections.

- Loss severity potential
- Injury potential to employees
- How quickly it can become unsafe
- Past history of failures

12. Name and briefly define four kinds of monitoring systems.

- Personal monitoring—measures the airborne concentrations of contaminants by placing the measuring device as closely as possible to the site at which the contaminant enters the human body.
- Environmental monitoring—measures contaminant concentrations in the workroom in

the general area adjacent to the worker's usual workstation.

- c. Biological monitoring—measures changes in composition of body fluid, tissues, or expired air to detect the level of contaminant absorption.
- d. Medical monitoring—medical personnel examine workers to see their physiological and psychological response to a contaminant.

13. The *toxicity* of a material refers to

- b. its capacity to produce injury or harm

14. Define *Threshold Limit Values* (TLVs).

Threshold limit values (TLVs) are the quantitative measurement of exposure limits.

15. Define permissible exposure limits (PELs).

Permissible exposure limits (PELs) are the legal maximum level of contaminants in the workplace air.

16. List the six main outcomes of an incident investigation.

- a. Incident investigations are conducted to determine direct causes
- b. Uncover contributing causes
- c. Prevent similar incidents
- d. Document facts
- e. Provide cost information
- f. Promote safety

17. Why is it important to investigate incidents immediately?

Incidents must be investigated immediately to ensure accurate details and to preserve evidence.

CHAPTER 10—INCIDENT INVESTIGATION, ANALYSIS, AND COSTS

1. Name the six fundamental activities needed for a successful incident-prevention program.
 - a. Study of all working areas to detect and eliminate or control the physical or environmental hazards that contribute to incidents
 - b. Study of all operating methods and practices and administrative controls
 - c. Education, instruction, training, and enforcement of procedures to minimize the human factors that contribute to incidents
 - d. Thorough investigation and causal analysis of every incident resulting in at least a lost-workday injury to determine contributing circumstances
 - e. Implementation of programs to change or control the hazardous conditions, procedures, and practices found in the preceding activities
 - f. Program follow-up and evaluation to ensure that the programs achieve the desired control

2. What is the primary purpose of an incident investigation?

The primary purpose of an incident investigation is to prevent future incidents. As such, the investigation or analysis must produce factual information leading to corrective actions that prevent or reduce the number of incidents.

3. What types of incidents should be investigated?

All incidents should be investigated, regardless of severity of injury or amount of property damage. The extent of the investigation depends on the outcome or potential outcome of the incident. An incident involving only first aid or minor property damage is not investigated as thoroughly as one resulting in death or extensive property damage, that is, unless the potential outcome could have been disabling injury or death.

4. Who is responsible for investigating an incident after it has occurred?

Depending on the nature of the incident and other conditions, the investigation is usually made by the supervisor, perhaps assisted by a fellow worker familiar with the process involved, the safety and health professional or inspector, the employee health professional, the joint safety and health committee, the general safety committee, or an engineer from the insurance company.

5. How soon after an incident has occurred should an investigation be started?

Each investigation should be conducted as soon after the incident as possible

6. What can a company learn from analyzing incident causes?

- a. Management can identify and locate the principal sources of incidents by determining, from actual experience, the methods, materials, machines, and tools most frequently involved in incidents, and the jobs most likely to produce injuries.
- b. Investigations may disclose the nature and size of the incident problems in departments and among occupations.
- c. Results will indicate the need for engineering revision by identifying the principal hazards associated with various types of equipment and materials.
- d. The investigation can disclose inefficiencies in operating processes and procedures where, for example, poor layout contributes to incidents, or where out dated, physically overtaxing methods or procedure can be avoided.
- e. An incident report will disclose the unsafe practices that need to be corrected by training employees or changing work methods.
- f. The report also will enable supervisors to put their safety work efforts to the best use by giving them information about the principal hazards and unsafe practices in their departments.
- g. Investigation results permit an objective evaluation of the progress of a safety program by noting in continuing analyses the effect of corrective actions, educational techniques, and other methods adopted to prevent injuries.

7. List the minimum data that should be collected for each incident.

- a. Data about employer characteristics
- b. Employee characteristics
- c. Characteristics of the injury
- d. Narrative description and accident sequence
- e. Characteristics of the equipment associated with the incident
- f. Characteristics of the task being performed when the incident happened
- g. Time factors
- h. Task and activity factors
- i. Supervision information
- j. Causal factors
- k. Corrective actions taken immediately after the incident to prevent a recurrence, including interim or temporary actions

8. What are the three basic steps in a systematic approach to selecting corrective actions?
- All major actions are considered.
 - The analyst does not stop with familiar and favorite corrective actions.
 - Each corrective action chosen for implementation is carefully thought out.

9. After thorough analysis of groups of incident investigations, what corrective actions might be suggested that were not evident when studying an individual case?

Inadequate policies, procedures, or management systems might be suggested by thorough analysis of groups of incident investigation reports that were not evident when studying individual cases.

10. What are the two general categories of work incidents for the purpose of cost analysis?
- Incidents resulting in work injuries or illnesses
 - Incidents causing property damage or interfering with production. (The inclusion of the no-injury incidents makes “work incidents” roughly synonymous with the type of occurrences a safety department strives to prevent.)

11. Why is a pilot study of uninsured costs preferred over the use of a fixed ratio such as 4 to 1?

A pilot study uses actual costs incurred by the organization and is fully justifiable. A fixed ratio of uninsured to insured costs such as Heinrich’s 4 to 1 ratio cannot be justified to management because it does not represent the organizations actual costs.

CHAPTER 11—INJURY AND ILLNESS RECORD KEEPING, INCIDENCE RATES, AND ANALYSIS

1. Safety personnel must maintain records for what three reasons?
 - a. It is required by law.
 - b. It is required management.
 - c. It improves safety programs.
2. List five of the seven ways a good record-keeping system can help the safety professional.
 - a. It provides the means to evaluate accident problems objectively and measures overall progress and effectiveness of the company safety program.
 - b. It identifies high incident rate units, plants, or departments and problem areas so extra effort can be made in those areas.
 - c. It provides data for an analysis of incidents pointing to specific causes or circumstances.
 - d. It creates interest in safety among supervisors by providing them with information about their department's incident experience.
 - e. It provides supervisors and safety committees with hard facts about their safety problems so their efforts can be concentrated.
 - f. It measures the effectiveness of individual countermeasures and determines if specific programs are doing the job they were designed to do.
 - g. It assists management in performance evaluation.
3. In which department does the collection of injury and illness data generally begin?
 - c. first-aid department
4. Which nonsafety professional should make a detailed report of each incident?
 - d. injured worker's supervisor
5. How often should a summary of injuries and illnesses be prepared?
 - b. monthly
6. In what publication are the OSHA record-keeping requirements found?

OSHA Form No. 300, Log and Summary of Occupational Injuries and Illnesses serves as the annual summary report that is used by any company subject to the OSHAct.

7. What is the formula for calculating incidence rates of recordable cases?

Incidence Rate of Recordable Cases:

$(\text{No. of injuries and illnesses} \times 200,000) / (\text{Total hours worked by all employees during period covered})$ or

$(\text{No. of lost workdays} \times 200,000) / (\text{Total hours worked by all employees during period covered})$

8. Why are many safety specialists concerned with the off-the-job injuries their employees incur?

Off-the-job disabling injuries have far exceeded on-the-job disabling injuries. Any unscheduled absence of employees can cause production slowdowns and delays, costly retraining and replacement, or costly overtime by remaining employees.

9. How are control charts used in the injury and illness data analysis process?

A chart of the kind used for quality control should be developed to evaluate the significance of changes over time in injury/illness as well as noninjury/illness incident experience. There are two kinds of control charts that are appropriate, depending on the situation. If the number of employee-hours worked is reasonably constant from month to month (i.e., the variation is within $\pm 10\%$ of the average), then a "C" chart, based on counts of injuries/illnesses, can be used. If the number of employee-hours fluctuates significantly from month to month, then a "U" chart, based on the incidence rate, should be used.

CHAPTER 12—OCCUPATIONAL HEALTH PROGRAMS

1. List five of the eight components of a good occupational health program.
 - a. Maintenance of a healthful work environment
 - b. Health examinations
 - c. Diagnosis and treatment for occupational injuries and illnesses
 - d. Case management services
 - e. Immunization programs
 - f. Confidential health records
 - g. Health promotion, education, and counseling
 - h. Open communication between the health personnel and the employee's personal physician
2. List the four basic objectives of a good occupational health program.
 - a. To protect employees against health hazards in their work environment.
 - b. To facilitate placement and ensure the suitability of individuals according to their physical capacities, mental abilities, and emotional makeup in work that they can perform with an acceptable degree of efficiency and without endangering their own health and safety or that of their fellow employees.
 - c. To assure adequate health care and rehabilitation of the occupationally injured.
 - d. To encourage personal health maintenance.
3. What is dermatitis caused by?

Contact of a chemical with the worker's skin
4. What two methods of controlling the work environment can reduce the rate of accidental injuries?
 - a. Worker education
 - b. Improved management techniques
5. The health service office (dispensary) should have a minimum of how many rooms?
 - c. four
6. List and briefly define the two kinds of emergency treatments.
 - a. Emergency treatment—given for immediate, life-threatening conditions; provided by the first aid staff until proper medical care can be given.
 - b. Prompt attention—treatment of minor injuries such as cuts, scratches, bruises, and burns that do not require medical attention.
7. Why should all employees report for medical treatment immediately when they are injured?

To reduce the risk of infection, disability, and missed diagnosis.
8. List five of the eight elements that a first-aid program should include.
 - a. Properly trained and designated first aid personnel on every shift
 - b. Instructions for contacting an ambulance or rescue squad
 - c. Posted method for transporting ill or injured employees
 - d. Posted instructions for calling physician and notifying the hospital that a patient is en route
 - e. Approved first aid unit and supplies
 - f. First aid manual
 - g. List of reactions to chemicals and routes of exposure
 - h. Adequate first aid record system and follow-up.
9. What federal agency outlines specific first-aid requirements at certain locations in mines and processing facilities?

MSHA
10. What is the objective of medical and surgical management in cases of industrial injury or disease?

Restoring disabled workers to their former earning power and occupation as completely and rapidly as possible
11. What is the primary purpose of preplacement examinations?

The primary purpose of a replacement examination program is to aid in the selection and appropriate placement of workers.
12. Explain the difference between light duty and limited duty.

Light duty is an adaptation of the worker's original job to reduce the worker's tasks. Limited duty is the placement of the worker in a new job that is appropriate to the worker's capabilities.
13. What is the primary purpose of exit examinations?

The primary purpose of exit examinations is to document the status of the health of the employee leaving the organization.

14. Emergency medical planning procedures should include what four items?
- Selection, training, and supervision of auxiliary nursing and other personnel
 - Transportation and caring for the injured
 - Transfer of the seriously injured to hospitals
 - Coordination of these plans with the safety department, security, police, road patrols, fire departments, and other interested community groups
15. How long (maximum) must employee exposure records be kept?
- 30 years after the employee leaves the company
16. List five of the eight ways in which the data from occupational health records can be used.
- Job placement.
 - Establishing health standards.
 - Health maintenance programs.
 - Treatment and rehabilitation.
 - Workers' compensation cases.
 - Epidemiologic studies.
 - Helping management with program evaluation and improvement.
 - Establishing a health profile of each worker.
17. Define *wellness*.
- Wellness* is defined as a way of life that promotes a state of health.
18. Lifestyle change programs are most effective when they employ a(n) _____ process.
- multistep

CHAPTER 13—INDUSTRIAL HYGIENE PROGRAM

1. Define *industrial hygiene*.

Industrial hygiene is the science and art devoted to the recognition, evaluation, and control of environmental factors or stresses arising in and from the workplace. These factors or stresses may cause sickness, injury, or significant discomfort and inefficiency among workers or citizens in the community.

2. Whom does the industrial hygienist work with to control environmental stresses or occupational health hazards in the workplace?

e. all of the above

3. List five control procedures that are used to reduce or eliminate exposure.

- a. Substitution of harmful or toxic materials with less dangerous ones
- b. Changing work processes to eliminate or minimize work exposure
- c. Installation of exhaust ventilation systems
- d. Good housekeeping/appropriate waste disposal methods
- e. Provision of proper personal protective equipment

4. List five factors of an effective industrial hygiene program.

- a. Anticipating and recognizing health hazards that arise from work operations processes by the industrial hygiene professional
- b. Evaluating and measuring the magnitude of the hazard by the industrial hygiene professional
- c. Control of the hazard
- d. Commitment and support of the industrial hygienist by management
- e. Recognition and trust of the industrial hygienist by the workers in the facility

5. The industrial hygienist is responsible for monitoring what types of environmental factors or stresses that can cause sickness, impaired health, or significant discomfort?

- a. Chemical
- b. Physical
- c. Biological
- d. Ergonomic

6. Which department is the most important to the industrial hygienist?

e. all of the above

7. Who, at minimum, should be members of the occupational health and safety team?

- a. Industrial hygienist
- b. Safety professional
- c. Occupational health nurse
- d. Occupational health physician
- e. Employees
- f. Senior and line management

CHAPTER 14—ENVIRONMENTAL MANAGEMENT

1. RCRA and CERCLA are used to regulate hazardous materials. What are the major differences?

CERCLA provides a federal “superfund” to clean up uncontrolled or abandoned hazardous-waste sites and emergency releases of contaminants into the environment. CERCLA allows the EPA to impose liability on facility owners or operators, but it is a controversial because of its cost/benefit ratio. RCRA regulates generation, treatment, storage, and disposal of hazardous wastes and requires owners/operators to undertake corrective action to clean up a facility.

2. What is a gap analysis when dealing with ISO 14001?

A gap analysis is a determination of where the company is relative to the requirements and development of a strategy to ensure ISO 14001 conformance.

3. What are four aspects that an environmental aspects review should address?

- a. Legislative and regulatory requirements
- b. Identification of significant environmental aspects
- c. Examination of existing environmental management practices and procedures
- d. Assessment of feedback from previous environmental incidents

4. What is the main purpose of the Eco-Management and Audit Scheme?

The purpose is to create a publicly available registry of environmental effects that have been verified by a third party.

5. What is the difference between ISO 14010 and ISO 14011?

ISO 14010 is the general principles for environmental auditing, while ISO 14011 is a specific auditing protocol.

CHAPTER 15—INDOOR AIR QUALITY

1. Explain the difference between sick-building syndrome and building-related illness.

Sick-building syndrome” (SBS) is a condition described by general complaints of discomfort including headache; nausea; dizziness; dry or itchy skin; eye, nose, throat, and respiratory irritation; dry coughing; difficulty concentrating; muscle pain; sensitivity to odors, and fatigue. Usually, the specific causes of the symptoms are not known. Complaints may be associated with a particular room or floor or may be widespread throughout a building. The symptoms are usually associated with time spent in the building and often cease after the affected occupant(s) leaves the building. Most affected occupants report relief soon after leaving the building.

The term “building-related illness” (BRI) is used when symptoms of diagnosable illness are identified and can be attributed directly to building contaminants. Quite often symptoms such as coughing, chest tightness, fever, chills, and muscle aches can be determined clinically and are the result of clearly identifiable causes. A diagnosis results in a clinically defined illness of known etiology. Allergic reactions, hypersensitivity pneumonitis, and humidifier fever would fall into this category.

Affected occupants with BRI may require prolonged recovery times after leaving the complaint area.

2. Name three items that can affect a building occupant’s health that are not related to IAQ.
- Illnesses contracted away from the workplace
 - Acute sensitivity (allergies)
 - Stress and other psychosocial factors
3. Name and discuss three control strategies commonly used to control IAQ problems.
- Manage pollutant sources either by removal, isolation, or controlling use
 - Use ventilation to dilute and remove the pollutant from the building
 - Use filtration to clean the air
4. What are three elements common to every IAQ problem?
- pollutant source(s)
 - A driving force to move the pollutant(s)
 - A pathway for the pollutant(s) to travel
 - A susceptible population

5. Occupant comfort is generally related to what two parameters controlled by conditioned air supplied by HVAC systems?

- Temperature
- Relative humidity

6. Describe two natural forces that can have a significant impact on IAQ.

Wind and weather patterns can cause infiltration and natural ventilation to move pollutants throughout a building

7. What are the duties of an IAQ manager?

An IAQ Manager should be responsible for coordinating all indoor air quality activities in the building.

8. A building IAQ profile should be developed using what sources of information?

- Identifying and reviewing records, such as blueprints and operating instructions
- Conducting a walkthrough inspection to document information on IAQ-related activities and conditions of building systems
- Identifying possible pollutant sources throughout the building
- Developing a non-complaint baseline for the building

9. An IAQ investigation should use interviews to look at what four areas?

- Who has concerns or is exhibiting symptoms
- When the symptoms are occurring
- Where in the building the onset of symptoms is associated
- What could be causing the problem

10. What two factors should initiate specialized sampling for contaminants?

- An identified pollutant source needs to be characterized
- Recommendations from health care practitioner

11. What are two preventive measures for minimizing the possibility of microbial contamination?

- General good housekeeping practices and maintenance of building, adequate ventilation, and good air distribution help minimize the possibility of microbial contamination.
- Higher efficiency air filters can also be effective in removing microbial contaminants.

12. Describe the difference between arrestance and atmospheric dust spot tests.

Arrestance is used to evaluate low-efficiency filters. Arrestance is determined by passing a standardized dust made up of various size particles through a filter and then determining the weight fraction of the dust removed. Arrestance values are usually high because most of the weight of the standardized dust is attributed to the larger particles. The arrestance values are of very little value when determining a filter's capability to remove the smaller particles that are usually implicated in indoor air quality scenarios.

The atmospheric dust spot test is used to rate medium-efficiency air cleaners (both filters and electronic air cleaners). The test is conducted by passing atmospheric dust through a filter. The removal rate is based on the air cleaner's capability to reduce soiling of a clean paper target and is related to the removal of very fine particles from the air. As a result, this test does measure smaller particles. However, the variability of atmospheric dusts used for testing may result in different efficiencies for the same filter depending on geographic location and time. Until a new standard is proposed, filters of 25% to 30% (as rated by ASHRAE 52.1 Atmospheric Dust Spot Method) are recommended.

13. Name and discuss three generally accepted methods for resolving IAQ problems.

- a. Pollutant source removal or modification is probably the most effective approach to resolving an IAQ problem when sources are known and control is feasible.
- b. Increasing ventilation rates and air distribution often can be a cost-effective means of reducing indoor pollutant levels.
- c. When there are strong pollutant sources, local exhaust ventilation may be appropriate to exhaust contaminated air directly from the building. Local exhaust ventilation is particularly effective in removing pollutants that accumulate in specific areas such as restrooms, copy rooms, and printing facilities.
- d. Air cleaning can be a useful but has certain limitations. Particle cleaning devices such as furnace filters are inexpensive but do not effectively capture small particles; high performance air filters capture the smaller, respirable particles but are relatively expensive to install and operate. A shortcoming of mechanical filters is that they do not remove gaseous pollutants. Adsorbent beds can remove some gaseous pollutants. Air cleaners can be useful, but should be used in conjunction with other control methods.

- f. Education and communication can be the two most important elements for both remedial and preventive indoor air quality management programs. When building occupants, management, and building staff understand the causes and consequences of IAQ problems and communicate effectively, problems can be prevented or solved if they do occur.

14. List five criteria that should be evaluated to determine the success of an implemented IAQ solution.

- e. Permanence
- f. Durability
- g. Operating principle initial & operating cost
- h. Control capacity
- i. Ability to institutionalize the solution
- j. Conformity with codes

CHAPTER 16—ERGONOMICS YESTERDAY, TODAY, AND TOMORROW

1. Ergonomists have received training in which fields of study that have contributed to the industry's understanding of ergonomics problems and solutions?

f. all of the above

2. Define *ergonomics*.

Ergonomics is the realization and application of user needs, abilities, limitations, and characteristics to design proper machines, tools, jobs, and workplaces that can result in productive, safe, comfortable, and efficient use. A shorter definition is that it focuses on ways to fit the work to the worker.

3. Define *musculoskeletal disorders*.

Musculoskeletal disorders are a group of conditions that involve the muscles, tendons, nerves, and supporting structures such as spinal discs. These disorders are caused or aggravated by risk factors at work. Some common disorders are carpal tunnel syndrome, epicondylitis, tendinitis, bursitis, and tension neck syndrome.

4. What disorder is known as “tennis elbow”?

Epicondylitis

5. What are the five goals of ergonomics?

- To reduce the physical and mental stressors associated with any type of job
- To increase the comfort, health, and safety of a work environment
- To increase productivity
- To reduce human errors associated with a task
- To improve the quality of work life as well as reduce the costs of doing business

6. Name three general categories of demands placed on the worker, and give examples of each.

- Physical demands—lifting, pushing pulling, reaching, exerting force to perform a task, the effort required to do the job, repetitive tasks; walking, standing, or sitting all day
- Environmental demands—vibration, temperature, humidity, noise, lighting levels, work organization, pace, shift schedule, need for overtime
- Mental demands—information needed to perform a particular task, mental calculations or computations, short-term memory demands, information processing, decision making

7. List the four components of an ergonomics program designed to manage cumulative trauma disorders (CTDs).

- Management commitment
- Case management process
- Training and education
- Workplace improvement process

8. What are the primary factors that are assessed during ergonomics evaluations?

- Workplace characteristics and accessories
- Physiological demands
- Physical demands
- Environmental demands
- Design of displays, control, and dials

9. List six occupational risk factors.

- Repetitive or sustained exertions
- Forceful exertions
- Awkward postures
- Mechanical stress
- Vibration
- Extreme temperature

10. Describe passive and active surveillance.

Passive surveillance refers to information that is gathered from existing records to identify potential patterns of disease within a workplace. Active surveillance incorporates a system for gathering data that can be used to determine trends of MSDs with greater sensitivity than a passive surveillance system. In contrast to passive surveillance, in which existing information sources are reviewed, active surveillance consists of operations involving the actual collection of relevant information and data.

11. List two ways to prevent/control work-related musculoskeletal disorders.

- Engineering controls
- Administrative controls

12. List three controls for reducing repetitiveness in job activities.

Any three of the following:

- Use automation
- Use power tools
- Provide short breaks
- Design for self-pacing

- e. Job enlargement; more variety of tasks
- g. Job rotation

13. List three controls for reducing awkward posture.

- a. Selecting appropriate tools for the job
- b. Moving part of the work closer to the worker
- c. Using mechanical aids to procure parts

14. Describe a “neutral posture.”

A neutral posture is one in which the back is naturally curved, the head is held erect, the shoulders are relaxed, the upper arms are close to the sides of the body, the wrists are straight, the elbows are bent at about 90 degrees, and the feet are well supported.

15. Why can a situation in which the job demands are below a worker’s capabilities be just as harmful as one in which the demands are too high?

Workers become bored when performing below their abilities. Boredom can lead to lapses in concentration and attention, resulting in product defects, quality problems, and accidents.

16. Guidelines and an equation for analyzing tasks to minimize back injuries were revised in 1991 by

- a. the National Institute for Occupational Safety and Health

17. List four factors that influence the postures assumed at work.

- a. Heights of object handled
- b. Location of work material
- c. Clearance required and accessibility of work
- d. Design of accessories

CHAPTER 17—EMPLOYEE ASSISTANCE PROGRAMS

1. An employee assistance program (EAP) is designed to assist in the identification and resolution of productivity problems associated with employees impaired by personal concerns including, but not limited to:

- a. health
- b. marital
- c. financial
- e. alcohol
- f. drug
- g. legal
- h. emotional
- i. stress

2. How much more often do workers involved with alcohol or drugs become involved in work-related injuries compared with other workers?

- a. 3–4 times

3. How is EAP assistance provided?

Assistance is provided through referrals to outside counseling or other treatment services in the community, treatment services provided by the EAP itself, or a wide variety of training and education program available through the EAP. Services are available to both the employee and members of the employee's immediate family.

4. What principle is vital to the functioning of any EAP in encouraging employees to willingly come forward to seek help, and why?

Confidentiality—employees need to feel that their employment is not threatened by participation in the EAP and that their problems will remain private.

5. Once the employee (or client) contacts the EAP for services, either voluntarily or by a supervisor's referral, the following steps should occur:

A professional assesses the client's problem and recommends treatment. The assessment and recommendation are recorded by the professional in confidential EAP files. Treatment or other services will be rendered, either through the EAP itself, by referral to providers under the employer's health plan, or through community services that are either free or must be paid for by the client. If the client is an employee who has taken time off work for treatment, the EAP may assist with reintegration to the work force as soon as practical. EAP staff will then conduct follow-up sessions with the client to support his or her recovery and to provide additional services if they are needed. When

the client's problem (such as a drug problem) may impact safety in the workplace or when the client was a supervisory referral, the EAP may monitor recovery to ensure that safety in the workplace is not compromised.

6. List five benefits that EAPs provide to employers.

- a. Morale improves as disruptive employees are helped.
- b. Managers spend less time working with troubled employees.
- c. Valued employees with personal problems remain with the company rather than resigning.
- d. Hiring and training costs are lower.
- e. Management spends less time and resources on discipline.
- f. Safety improves and liability declines.

7. In setting up an EAP, an EAP advisory committee should be formed, composed of members from which group(s)?

- e. all of the above

8. What factors should be considered in a needs assessment to define the major types of employee problems and the kind of EAP services needed to address those problems?

- a. Type of organization and industry
- b. Number of worksites
- c. Type of work/jobs
- d. Size of work force and demographics (sex, age, ethnicity, education, special needs)
- e. Major employee problems (from benefits and workers' compensation data)
- f. Risk management issues (from safety, medical, and insurance data)
- g. Management and labor identification of problem issues
- h. Regulatory requirements of government agencies
- i. Resources available to EAP from the corporation.

9. List the five major types of EAPs.

- a. Internal—services delivered by professionals employed by the organization
- b. External—services delivered by a contracted vendor
- c. Union-based—services delivered by trained union personnel to union members
- d. Consortium—a group of smaller companies banded together to jointly contract with an EAP
- e. Blended—any combination of the above

10. What is considered a strength of an internal EAP?
- e. all of the above
11. Stemming from the OSH Act General Duty Clause, employers have legal duties to employees, customers, clients, and third parties in situations involving
- b. workplace violence.
12. List five of the nine EAP products that should be considered by the advisory committee to meet the needs of the organization.
- a. Treatment services
 - b. Managed care
 - c. Treatment follow-up and monitoring of recovery
 - d. Substance abuse professional services and other regulatory compliance
 - e. Management of workplace threat and violence
 - f. Critical incident stress debriefing
 - g. Work/family services
 - h. Employee training
 - i. Management consultation and organization development
13. In monitoring a drug addict after treatment, what are three methods of follow-up?
- a. Regularly scheduled calls or client visits to the EAP
 - b. Regular reports to EAP staff from a professional aftercare provider
 - c. Random drug or alcohol testing coordinated by the EAP

CHAPTER 18—EMERGENCY PREPAREDNESS

1. What should be the first concern in planning for an emergency?
 - b. ensuring the safety of employees and the public
2. The first step in the emergency-planning process begins with determining what types of hazards/emergencies may affect the organization. Name 8 of the 11 types of emergencies.
 - a. Fire and explosion
 - b. Floods
 - c. Hurricanes and tornados
 - d. Earthquakes
 - e. Civil strife and sabotage
 - f. Work accidents and rumors
 - g. Shutdowns
 - h. Wartime emergencies
 - i. Hazardous materials
 - j. Radioactive materials
 - k. Weather-related emergencies
3. Many sources of hazard/emergency information can help management determine the likelihood of specific emergency events in a locality. List 5 of the 7 sources.
 - a. Historical knowledge and records of accidents
 - b. Fire statistics
 - c. National Weather Service logs
 - d. U.S. Geological Survey studies
 - e. Location of rail lines
 - f. Location of airports
 - g. Local U.S. Hazard Vulnerability Community
 - h. Analysis documents
4. The second step in the planning process should be
 - d. Preparing a specific emergency plan of action
5. What are 6 of the 12 considerations that should be addressed within the specific plan of action?
 - a. Chain of command
 - b. Training
 - c. Hazardous materials/spills emergencies (HAZMAT)
 - d. Command headquarters
 - e. Uniform incident command system (ICS)
 - f. Emergency equipment
 - g. Alarm systems
 - h. Fire brigades
 - i. Facility protection and security
 - j. Emergency medical services (EMS)
 - k. Warden service and evacuation
 - l. Transportation

6. Why is disaster training one of the most important functions of the director and staff, on both the corporate and facility levels?

Disaster training is essential in keeping a disaster-control plan functioning in good working order. Simulated disaster drills help key people and employees respond to emergencies with greater confidence and effectiveness. Feedback from training drills helps to improve emergency management plans.

7. Which OSHA regulation addresses aspects of health and safety that are now legally required at hazardous materials sites; treatment, storage, and disposal facilities; and other hazardous materials emergency locations?

The U.S. OSHA regulation entitled Hazardous Waste Operations and Emergency Response: Final Rule

8. What is the function of the hazmat team?

The function of the HAZMAT team is to control and stabilize actual or potential leaks or spills of hazardous substances requiring possible close approach to the substances.

CHAPTER 19—WORKPLACE VIOLENCE

1. What sources of violence can be risks for the workplace?

At least \$500 million, according to Liberty Mutual Research Institute for Safety, “2006 Liberty Mutual Workplace Safety Index.” Boston: Liberty Mutual, 2007, page 2.

2. List three steps a small business should take to plan for possible violence.

- a. Make an effort to keep in touch with employees, and promote an open atmosphere where employees can feel comfortable going to management with issues and know that they will be listened to.
- b. Pay attention to business cycles, such as periods where business will be heavier than others.
- c. Focus on accountability: hold each employee responsible for completing his or her job/assignments. This will highlight situations that could create the potential for violence.
- d. Treat all employees equally.
- e. Consider programs to provide outlets for aggression, no matter how small (companywide recreational activities/ competitions, monthly dinners, etc.).
- f. Have a consistent, flexible policy for altering work schedules/taking time off.
- g. Consult community organizations for additional resources (Rugala and Isaacs 2004, 50–52).

3. How is domestic violence defined?

Domestic violence in the workplace consists of any behavior that takes place between an employee and a spouse or other family member that results in the employee being abused, either at home or at the workplace. The employee may be physically beaten, threatened, isolated, emotionally and/or mentally abused, sexually abused, or even controlled by economic means.

4. What are four signs that domestic violence may be occurring?

- a. excessive tardiness or unexplained absences
- b. frequent, and often unplanned, use of leave time
- c. anxiety
- d. lack of concentration
- e. a change in job performance
- f. remaining isolated from co-workers and/or showing reluctance to take part in social events
- g. receiving disruptive phone calls or e-mails
- h. unexplained bruises or injuries

- i. disruptive and recurring visits from a current or former intimate partner
- j. acting uncharacteristically moody, depressed, or distracted
- k. being the victim of vandalism or threats

5. Name four elements that should be included in a workplace violence prevention strategy.

- a. management commitment and employee involvement
- b. a policy statement
- c. a threat assessment team
- d. workplace analysis
- e. hazard prevention and control
- f. training
- g. incident response
- h. program evaluations
- i. record keeping

6. What elements should be covered in workplace violence training?

- a. a definition of workplace violence
- b. general warning signs of workplace violence
- c. a description of the employer’s workplace violence prevention program, including:
 - i. identified risks/hazards in the workplace
 - ii. what controls were implemented to reduce hazards, and how to use them
 - iii. incident reporting procedures
 - iv. management procedures for incident investigation, response, and follow-up procedures
- d. the location and operation of safety equipment
- e. how to defuse potentially violent situations
- f. what to do in an emergency situation
- g. how to contact law enforcement during an emergency
- h. emergency response protocols (bomb threats, hostage situations)
- i. personal security measures
- j. employer policies and procedures on how to obtain medical care or counseling after an incident and how to file workers’ compensation claims or seek legal assistance after an incident

CHAPTER 20—PRODUCT SAFETY MANAGEMENT

1. What are the liability and publicity consequences of failure in designing safe products?

Poor product safety/compliance can result in consumer injuries and illnesses, product recalls, damaged corporate reputation, lawsuits, and overall business disruption.

2. How will global connectivity of safety regulators affect local product makers?

Government agencies globally are increasingly collaborating on common product safety issues. In many cases, a product safety hazard occurring in one part of the world may be reportable to government agencies in other countries if the same or a similar product is sold in those locations.

The decision to report a potential product defect or safety risk to a government agency can be a very tough decision. There is the inherent fear that the agency will demand an immediate product recall upon hearing of the issue. Having a well-established relationship with applicable government agencies provides the foundation for honest debate about the proper course of action.

3. How should a product safety assessment for a brand new product be structured?
 - a. Evaluation of all ingredients, all constituents, all “formed” materials as a result of chemical reactions, possible contaminants, and the finished product as a whole
 - b. Consideration of intended uses, reasonably foreseeable unintended uses, and possible misuses
 - c. Assurance that all ingredients/finished products meet all regulatory requirements and are on approved country inventory lists
 - d. Evaluation of new safety compliance risks posed in the manufacturing process of new products
 - e. Consideration for the “perceived” risks posed by a new product or technology. This will have to take into account possible consumer reactions and concerns. Unaddressed consumer complaints and allegations can spread quickly in electronic media and destroy a brand in a short time.

CHAPTER 21—INDUSTRIAL SANITATION AND PERSONNEL FACILITIES

1. The general rule for sanitation includes:
 - e. all of the above
2. How many infectious waterborne diseases are commonly caused by drinking contaminated water?
 - d. at least 12
3. Name the three adulterations that can contaminate water supply.

One of the most common ways a water supply becomes contaminated is by accidental entry of sewage or septic water into a drinking water supply.
4. Faucets and similar outlets should be at least how far above the flood-level rim of the receptacle?
 - a. 1 in.
5. How can a worker easily disinfect a drinking water system?

A worker can easily disinfect a drinking water system by filling it with water containing not less than 100 mg/l of available chlorine. This solution should remain for 24 hours in either a new system or one that has not previously carried treated water.
6. Name the two methods of water purification that are the most practical for industrial private water supplies.
 - a. Filtration
 - b. Chemical disinfection
7. List six recyclable materials that can be hazardous to employees when sorting and collecting them.
 - a. Glass
 - b. Metals
 - c. Paper
 - d. Batteries
 - e. Chemicals
 - f. Cardboard
8. What are the five personal service facilities that contribute to employee comfort and are essential to the occupational health program in most industries?
 - a. Drinking fountains
 - b. Washrooms
 - c. Locker rooms
 - d. Showers
 - e. Toilets

9. Codes require how many drinking fountains to be installed for every 50 people throughout an industrial facility?
 - a. 1
10. List four factors to consider when selecting a floor for washrooms and locker rooms.
 - a. Nonabsorbency
 - b. Durability
 - c. Sanitation
 - d. Slipping and falling hazards
11. Janitorial service workers should mop floors and clean fixtures in all personal service facilities with detergent and hot water at least:
 - c. once daily
12. Two important safety and health precautions that should be followed in the use of microwave ovens are:
 - a. All repairs should be made by manufacturer authorized repair personnel.
 - b. Persons with cardiac pacemaker units should be warned against coming too close to microwave ovens.
13. List the six main types of industrial food services.
 - a. Cafeterias preparing and serving hot meals
 - b. Canteens or lunchrooms serving sandwiches, other packaged foods, hot and cold beverages, and a few hot foods
 - c. Mobile canteens that move through the work areas, dispensing hot and cold foods and beverages from insulated containers
 - d. Box-lunch service
 - e. Vending machines
 - f. Food trucks
14. What is the best way for workers to combat fatigue and maintain normal blood sugar?
 - c. Eat a breakfast or snacks high in protein.
15. Food-service equipment should either receive approval from or meet established standards of which organizations?

Food-service equipment should receive the approval from or meet established standards of the National Sanitation Foundation (NSF).

CHAPTER 22—OCCUPATIONAL MEDICAL SURVEILLANCE

1. What is the ultimate goal of surveillance in the workplace?

The ultimate goal of surveillance in the workplace is prevention of illness or injury due to ambient risks.

2. What are the four components of an occupational surveillance system?
- Gathering information on adverse health events and exposure circumstances
 - Distilling and analyzing the data
 - Disseminating data to interested parties
 - Intervening on the basis of the evidence provided by the data to alter the factors that produced the hazards and adverse health outcomes
3. What are the specific uses of a surveillance system?

Specific uses of a surveillance system include allowing public health officials, employers, researchers, enforcers, and other stakeholders to:

- become familiar with the magnitude and distribution of occupational illnesses and injuries
- monitor trends over time
- identify emerging injury and exposure problems
- flag specific case or situations for follow-up investigations
- set intervention priorities
- evaluate intervention activities

4. What is the difference between surveillance and screening?

The difference between surveillance and screening is surveillance is defined as prevention of injury or illness due to ambient risk. Surveillance focuses on monitoring the health of working populations and the exposure to hazards in the workplace. Medical screening involves the performance of medical testing on workers and worker populations for the purpose of detecting organ dysfunction and/or disease before the worker would seek medical care when intervention would be most beneficial.

5. What are some components to consider when establishing a medical screening program?

Some components to consider when establishing a medical screening program include, assessing the hazards; identifying the target organ toxicity; developing action criteria; standardizing the testing process; performing the tests; interpreting the results; and evaluating and controlling exposure, to name a few.

6. What is a “sentinel health event,” and what is its significance?

A “sentinel health event” is a disease, disability, or untimely death that is occupationally related. It is significant because its occurrence may provide the impetus for epidemiological or industrial hygiene studies and/or serve as a warning that materials substitution, engineering control, personal protection, or medical care may be required.

7. What are biomarkers? What are their limitations? What are associated ethical and legal concerns?

Biomarkers are substances, structures, or processes that can be measured in human tissues that may predict disease. Limitations on biological monitoring include, difficulty correlating a health risk with exposure; short biological half-lives of some substances; ineffective monitoring for surface active agents; interference of tobacco, alcohol, and other agents; measurements that may reflect multiple exposure sources. One ethical and legal concern of using biomarkers is the potential for discrimination against workers on the basis of racial or cultural characteristics and acquired or inherited genetic susceptibility.

8. Explain the synergistic effect of substances and give an example.

The synergistic effect of substances can be described as the way the human body responds when exposed to more than one toxin or hazardous substance at the same time. That is, with each chemical or substance to which a worker is exposed, the total effect becomes greater than the sum of the parts. An example of this is cigarette smoking combined with exposure to asbestos. When someone is exposed to these two substances simultaneously, the chance of developing lung cancer is greatly increased.

CHAPTER 23—WORKERS WITH DISABILITIES

1. The 1990 U.S. Americans with Disabilities Act (ADA) encompasses what five general areas?
 - a. Title I—Employment Provisions
 - b. Title II—State and Local Government Provisions
 - c. Title III—Public Accommodations and Services Operated by Private Entities
 - d. Title IV—Telecommunications
 - e. Title V—Miscellaneous Provisions
2. If an employer denies a disabled individual a specific job, management must prove that the person is unqualified because of what four reasons?
 - f. The job would put the individual in a hazardous situation.
 - g. Other employees would be placed in a hazardous situation if the person were on the job.
 - h. The job requirements cannot be met by an individual with certain physical or mental limitations.
 - i. Accommodation of the job cannot reasonably be accomplished.
3. What three occurrences in the 1940s stimulated hire-the-disabled programs?
 - a. Many individuals with disabilities were hired to help fill job vacancies left by employees who joined the military.
 - b. Companies established affirmative action programs to help each returning disabled veteran to become an employable person.
 - c. The U.S. Department of Labor published a study that showed disabled workers were as productive as other workers, had lower frequency and severity of injury rates, and were absent from work only one day more per year than other workers.
4. List the three types of disabled persons seeking employment as defined by law.
 - a. The disabled individual
 - b. The disabled veteran
 - c. The qualified disabled individual
5. Examples of “reasonable accommodation” include:
 - f. only a, b, and c
6. Explain four general responsibilities of the safety and health professional in relation to disabled employees.
 - a. Maintaining close liaison with the Equal Employment Opportunity manager-coordinator and with medical and personnel departments when they are placing disabled employees
 - b. Making job safety hazard analysis of existing work based on the job responsibilities and the abilities and limitations of the disabled employee or applicant when employing, promoting, transferring, and selecting workers with disabilities
 - c. Making recommendations for safety modifications of machine tools, established processes and procedures, and existing facilities and workplace environment when the company must make reasonable accommodations for disabled employees
 - d. As required, cooperating with the plant or building engineer or mechanical engineer and the planning, production, and maintenance departments when disabled employee accommodations are being evaluated
7. The safety evaluation form for disabled employees should be kept for at least one year after the employee leaves the company.
8. What are the four factors employers must consider when appraising a job for employees with one or more disabilities?
 - a. Physical requirements
 - b. Working conditions
 - c. Health hazards
 - d. Accident hazards
9. What are six important factors to consider when designing access to facilities for disabled workers?
 - a. Cafeteria, washroom, and restroom facilities
 - b. Width of doors
 - c. Height of plumbing fixtures
 - d. Electrical controls
 - e. Phones
 - f. Drinking fountains
10. To accommodate disabled persons, the entrance width to a building should be:
 - b. 32 in. (80 cm)
11. Desktops should be no less than how many inches above the floor to accommodate wheelchairs?
 - a. 28 in. (70 cm)
12. One means of safely evacuating wheelchair users and permanently or temporarily disabled persons is through the use of an evacuation chair.

CHAPTER 24—RETAIL/SERVICE FACILITIES LOGISTICS

1. The indirect costs of incidents are ____ times the direct costs.
b. 5 to 20

2. List five of the eight components of a sound risk management program.

- a. Policy statement
- b. Employee manual
- c. Safety committee
- d. Safety audits
- e. Training
- f. Drills/practices
- g. Investigation and action
- h. Corporate safety culture

3. An employee manual should not only define the required level of safety, but also give specific instructions.

4. Briefly define the General Duty Clause.

The employer is responsible for providing employees with a safe place of employment free from recognized hazards that are causing or likely to cause death or serious physical harm to the employees.

5. What is the difference between OSHA Form 300 and OSHA Form 301?

OSHA Form 300 serves as a log and summary of all occupational injuries and illnesses. OSHA Form 301 provides detailed information on each of the cases recorded on the OSHA Form 300.

6. List five of the eight OSHA requirements for all means of egress.

- a. exits sufficient to permit prompt escape in case of fire or other emergency
- b. a building that is constructed, arranged, equipped, maintained, and operated to avoid undue danger to its occupants
- c. exits that are of the proper type, location, and number for the building
- d. exits that are accessible at all times, when it is occupied
- e. exits that are clearly visible and marked in a conspicuous manner (lights, signs)
- f. adequate and reliable emergency lighting for all exits
- g. fire alarms in a building of such size, arrangement, or occupancy that individuals may not be immediately aware of the fire
- h. training and drills in emergency exit procedures

- i. at least two accessible exits that remote from each other in each building

7. Briefly define HAZCOM.

A standard that provides, to the workers, the identities and hazards, and appropriate protective measures for the chemicals to which they are exposed

8. List four main of the requirements of the hazard communication standard.

- a. written hazard communication program
- b. labels and warning on containers of chemicals
- c. Safety Data Sheets available for review by employees
- d. information and training for potentially exposed employees.
- e. documented hazard communication training for all employees
- f. provisions for communicating with contractors on chemicals their employees may be exposed to in the facility and providing chemical information on chemicals brought into the facility by contractors for work conducted, such as repairs

9. Briefly describe the tagout procedure.

To safeguard employees from hazardous energy during equipment maintenance, tag out procedures require that all control surfaces be tagged to instruct all parties not to open or operate such controls until the tag is removed.

10. Which of the following machines/equipment are not covered by tagout standards?

- c. ventilation hoods

11. Company posting of emergency phone numbers is a sufficient action under OSHA regulations.

- a. true

12. All storage and materials should be kept at least ____ ft from all major electrical equipment.

- a. 3

13. During physical capacity screening, an applicant is considered qualified when his or her capabilities meet or exceed the job demands.

14. List four of the six topics that an orientation program should cover.

- a. employee responsibilities and discipline
- b. safety rules

- c. accident/incident reporting
- d. general fire protection
- e. emergency procedures
- f. security alarms and inventory controls

15. Materials handling is the area that has the greatest risk for injuries.

16. Briefly define ergonomics.

Ergonomics may be defined as the study of people at work and the use of various methods to create a good fit between the employee and the job.

17. Ergonomics programs should contain which four basic activities?

- a. identify the problems
- b. study the physical demands of the job
- c. create a written action plan
- d. maintain the effort

18. The leading cause of death in the workplace is

- a. violence.

19. What are the two major types of exposure to workplace violence?

- a. crime-related violence
- b. employment-related violence

CHAPTER 25—TRANSPORTATION SAFETY PROGRAMS

1. An organization's vehicle collision-prevention efforts should focus primarily on what two factors?
 - a. driver error
 - b. vehicle failure
2. Which of the following statements is true?
 - a. The total cost of a vehicle collision is usually more than the amount recovered from the insurance company.
3. List the five basic elements that a vehicle safety program should provide.
 - c. A written safety policy—developed, supported, and enforced by management
 - d. A person designated to create and administer the safety program and to advise management
 - e. A driver safety program, including driver selection procedures, driver training, and safety-motivating activities; proper supervision and implementation are mandatory for success
 - f. An efficient system for collision investigation, reporting, and analysis; determination and application of appropriate corrective action; and follow-up procedures to help prevent future collisions
 - g. A vehicle preventive maintenance program
4. What two factors should be considered when first screening an individual who is applying for a job that requires driving?
 - a. the applicant's driving record
 - b. the applicant's personal traits
5. The four objectives of a preventive maintenance program are:
 - a. to prevent collisions and delays
 - b. to minimize the number of vehicles down for repair.
 - c. to stabilize the workload of the maintenance department
 - d. to save money by preventing excessive wear and breakdown of equipment and unscheduled downtime.
6. Repair shop workers should receive training in safe practices whenever:
 - e. all of the above

7. Which regulation has established procedures for urine drug testing and breath-alcohol testing of all employees who work in safety-sensitive jobs?

U.S. Department of Transportation (DOT) rule 49 CFR part 40

8. Why should companies implement their own internal safety education programs?

Safety education programs should be developed to meet the needs of the company and reflect the values of the company while ensuring compliance with regulations and federal mandates.

CHAPTER 26—OFFICE SAFETY

1. What is the most common and most severe type of office incident?
 - c. worker falling
2. List five of the nine different elements of an office layout that can be hazardous to workers.
 - a. Stairways, exits, and doors
 - b. Lighting
 - c. Ventilation
 - d. Electrical equipment/outlets
 - e. Equipment placement
 - f. Floors
 - g. Parking lots and sidewalks
 - h. Aisles
 - i. Storage of materials
3. In addition to contributing to the safety of an office, which of the following improves the attitudes of both employees and visitors?
 - d. all of the above
4. Improper floor surfaces are one of the major causes of office incidents. What should be done to make floors safer?
 - a. Floors should be as durable and maintenance free as possible
 - b. Management should select floor finishes for slip-resistant qualities
 - c. Well-maintained carpet should be provided to protect against slips and falls
 - d. Maintenance staff must repair defective tiles, boards, or carpet immediately
 - e. Worn or warped mats under office chairs and rubber or plastic floor mats with curled edges or tears should be repaired or replaced
5. Define *ergonomics*.

Ergonomics is the science of optimizing a system by designing for the capabilities and limitations of the human interacting with it.
6. Three basic factors to consider when designing a seated workstation are:
 - a. visual demands
 - b. posture and reaches required
 - c. the muscular strength and repetition exerted to perform the task
7. To help prevent visual and/or muscular fatigue when looking at the computer screen:
 - a. The screen should be placed at or slightly below seated eye height.
 - b. The screen should be at a comfortable distance that suits the visual acuity of the operator so that he or she does not have to lean forward.
 - c. The screen should be far enough away so that the operator does not have to move his or her head to read the whole screen. The operator should be able to scan the screen by simply moving the eyes.
 - d. The screen should be placed directly in front of the operator to minimize twisting of the trunk or neck.
8. Which of the following tells the “who, what, when, why, and how” of incidents in the office?
 - b. Incident records

CHAPTER 27—LABORATORY SAFETY

1. How close should emergency showers and eyewashes be located to areas where hazardous chemicals are used?

Emergency showers and eyewashes should be within 10 seconds of travel time from areas where hazardous chemicals are used.

2. The four stages of the management system approach to safety are:

- a. Plan
- b. Do
- c. Check
- d. Act

3. The three key sources of chemical safety information are:

- a. Safety Data Sheets (SDSs)
- b. Chemical labels
- c. Laboratory chemical safety summaries (LCSSs) and other reference materials

4. Which of the following is a key piece of chemical safety information in assessing the risk of a particular chemical?

- c. concentration of the chemical solution

5. Distinguish between primary and secondary containment in biosafety.

Primary containment focuses on the protection of workers and the immediate laboratory environment from exposure to infectious agents. Secondary containment protects the environment outside the laboratory from contamination with infectious materials.

6. List and describe the different levels of biosafety.

- a. BSL-1: attained through standard microbiological practices
- b. BSL-2: attained through engineering controls such as biosafety cabinets
- c. BSL-3: attained through facility design beyond use of equipment in the lab
- d. BSL-4: requires use of high level personal protective equipment as well as facility design.

7. At what biosafety level is human blood appropriately handled?

BSL-2

8. The role of a radiation safety officer (RSO) includes

- c. communicating with regulatory agencies on behalf of the company.

9. What are the four basic radiation protection methods?

- a. Maintaining distance from the source
- b. Minimizing time of exposure
- c. Shielding from the source
- d. Minimizing the quantity of the radioactive materials used

10. The term *laser* is an acronym for what words?

Light amplification by stimulated emission of radiation

11. Lasers use which of the following as the active medium?

- d. all of the above

12. At what wavelengths of light do lasers operate?

- d. all of the above

13. List the general types of health problems that are associated with clean rooms.

Skin and eye irritation from dry environment, fatigue from ergonomic challenges, and psychological issues from unchanging environment

14. Which of the following is not an important strategy for dealing with laboratory ergonomic issues?

- c. providing background music in the laboratory

15. Which emergency responders should be consulted in planning for laboratory emergencies?

- e. all of the above

CHAPTER 28—CONTRACTOR AND CUSTOMER SAFETY

1. How does 29 CFR 1910.119, Process Safety Management of Highly Hazardous Chemicals, Explosives, apply to contractor and guest/customer safety?

The rule 29 CFR 1910.119, Process Safety Management of Highly Hazardous Chemicals, Explosives, applies to contractor and guest/customer safety because more employers are accepting responsibility not only for the safety performance of their own workers but for the improved safety performance of outside contractors they hire. A comprehensive, systematic safety program can produce the following immediate and long-term benefits:

- reduced injuries and liability risks
- reduced potential regulatory action
- reduced potential for damage to the employer's facility and contractor's equipment
- increased productivity and lower overall costs.

2. Studies of West Coast companies that routinely hired contractors and subcontractors highlighted the following key factors in companies with excellent safety records. Cite three.

- a. Strong employer management—Employers clearly define the jobs contracted workers will do and keep tight control of schedules, responsibilities, training, and problem solving.
- b. Effective coordination of job tasks—All in-house and outside employees know their roles and responsibilities and to whom they report. Management makes an effort to foster a spirit of teamwork and cooperation among all employees.
- c. Employer emphasis on safety—Employers emphasize safety in their daily communications, reflecting top management's commitment to safe work practices and to safety in general.
- d. Strong interpersonal skills of supervisory personnel—Recognition of the individuality of workers and respect for their experience, ideas, and feelings enhances their adherence to safety practices and procedures.
- e. Safe work environment in the employer's facility—If outside employees see that safety is already a top priority in the company, they will take safety more seriously. Employers should make sure that their workplaces conform to all current safety regulations and that written materials, posters, Safety Data Sheets, and other safety-related materials are posted in a prominent location.

3. Regarding 29 CFR 1910.119, does the final rule require that employers refrain from using contractors with less-than-perfect safety records?

No, however, the employer does have the duty to evaluate the contract employer's safety record.

4. Why do insurance companies use EMRs (experience modification rates) when considering workers' compensation insurance?

Insurance companies use EMRs when considering workers' compensation insurance because they look at the worker's compensation experience over a three-year period, and they are a more objective measure of a company's safety record than the OSHA incidence rate.

5. What is indicative of lower rates?

The lower a firm's rates, the better its safety record is likely to be. A company with a rating of less than 1.0 has a better loss record compared to similar companies (within the United States) doing the same type of work. A company with a 0.70 rating is 30% better than the average company and pays less for workers' compensation insurance.

6. When should the safety orientation between the employer and contractor management take place?

The employer should meet with contractor management and safety staff to conduct a safety orientation and review session before work begins.

7. Identify three of the five recommended items to be addressed and documented by the employer.

- a. worksite safety requirements, including providing safety manuals and standards related to the proposed work
- b. a detailed outline of the safety responsibilities of the employer, outside management, and outside workers
- c. any special hazards that exist at the worksite, including a review of hazardous materials and relevant SDSs
- d. training requirements, including orientation, for outside personnel
- e. a schedule to review safety auditing, performance, and training programs after the first few days and weeks on the job.

8. What is an attractive nuisance? Describe one.

An *attractive nuisance* refers to liability associated with a dangerous condition that is generally a threat to

children. It excuses trespassing and penalizes an organization for failure to keep children away from the hazard or for failure to protect or eliminate a hazard that may reasonably be expected to attract children to the premises. A swimming pool is often considered an attractive nuisance because children are drawn to it, regardless of the protective features.

9. What is the most important feature of a parking lot?

The most important feature of a parking lot is the easy-to-use layout, adequate signs, and conspicuous markings because they help make a parking lot safe and attractive.

10. How often should escalators be examined?

Escalators should be inspected from landing to landing every day. This includes riding them before the store opens to discover any defects. Once a week, inspect the escalators as follows:

- Replace any broken treads or fingers in step treads and combplates.
- Examine handrails for damage.
- Check balustrades for loose or missing screws and for damaged or misaligned trim.

11. Where should emergency stop buttons be located for an escalator?

Escalators should have an emergency stop button or switch located at the top and the bottom landing. These must stop but not start the escalator.

12. What three types of information should an elevator logbook contain?

- day, month, year, and time of inspection
- observations by mechanics or inspectors
- all breakdowns, including causes and corrective action(s)
- initialed and dated entries.

13. How often should all elevators have a balance test and contract load test?

Elevators should have a balance test and contract load test at least every three years.

14. What are the four stages of a fire?

- Incipient stage—No visible smoke, flame, or significant heat develops, but a large number of combustion particles are generated over time. These particles, created by chemical

decomposition, have weight and mass but are too small to be visible to the human eye. They behave according to gas laws and quickly rise to the ceiling. Ionization detectors respond to these particles.

- Smoldering stage—As the incipient stage continues, the combustion particles increase until they become visible—a condition called smoke. No flame or significant heat has developed. Photoelectric detectors “see” visible smoke.
- Flame stage—As the fire condition develops further, ignition occurs and flames start. The level of visible smoke decreases and the heat level increases. Infrared energy is given off that can be picked up by infrared detectors.
- Heat stage—At this point, large amounts of heat, flame, smoke, and toxic gases are produced. This stage develops very quickly, usually in seconds. Thermal detectors respond to heat energy.

15. Identify two of the criteria that designate high-rise buildings?

- The size of the building makes personnel evacuation impossible or impractical
- Part or most of the building is beyond the reach of fire department aerial equipment.
- Any fire within the building must be attacked from within because of building height.
- The building has the potential for “stack effect”

16. Briefly discuss the advantages of a protected air-conditioning system.

Unprotected air-conditioning systems represent a major exposure to fire and smoke spread if not properly safeguarded. Without automatic smoke and heat detection, automatic fan shutdown, and automatic fire dampers, smoke and toxic fumes can be quickly drawn into the exhaust or return air duct system and promptly distributed to other floors and areas of the building served by the air-conditioning system.

17. Your place of employment is suddenly the target of an outside demonstration. What are your first two duties?

- Advise employees to call security and/or management. Security should telephone police, advise them of the situation, and follow their instructions.
- Arrange for two or more key personnel to assume previously assigned positions at all store entrances and other key points; they should know security’s telephone number to relay information and to receive instructions

18. The demonstration has moved inside. What five precautions should be taken?
- a. Advise all employees to avoid any comments, antagonism, or physical contact with demonstrators, refer all queries to a member of management, and above all keep calm.
 - b. In areas where demonstrations are taking place, have employees stop selling, lock their registers, remain in their areas keeping as calm as possible, and await further instructions from their supervisors.
 - c. In areas where “business as usual” is being maintained, arrange for frequent cash pickups.
 - d. Key personnel and employees should take their assigned places, as discussed earlier.
 - e. If such a demonstration turns into group looting or group “hit-and-run” stealing, employees should not attempt to make any apprehensions. Security personnel will follow previous orders for such conditions, as advised by management. Remember, personal safety is more important than property protection.
19. What are two of the most common sources of guest/customer incidents on the premises?
- a. Slips
 - b. Falls
20. Before allowing swimmers into the pool after a chemical treatment, what should be done?

Make sure that pool water has the proper pH balance.

CHAPTER 29—HOMELAND SECURITY COMPLIANCE IN THE WORKPLACE

1. What are the categories of “chemical releases” covered by federal rules?

The categories are toxic, flammable, and explosive releases.

2. Why are some sites considered “high risk”?

Their chemical types and volumes make the sites “high risk.”

3. Why are some sites excluded from coverage under the chemical facility protection rule?

Some sites are excluded because they already have plans. Facilities excluded from the rule are those with extensive federal controls already in place; these include railroads, public water systems, and certain port activities.

4. What plans will sites negotiate with the government?

Plant sites will negotiate site security plans with the Department of Homeland Security.

5. What role does the ISAC play?

ISAC is a group of companies that receives and shares terrorism avoidance data from the government concerning threats and potential attacks.

CHAPTER 30—MOTIVATION

1. Define *motivation*.

Motivation means moving people to action that supports or achieves desired goals. When someone has an internal drive to acquire something, it can be said that he or she is *motivated* to acquire it.

2. List five of the seven psychological factors that directly influence the success of a safety program.

- a. individual differences
- b. motivation
- c. emotions
- d. stress
- e. attitudes
- f. behaviors
- g. learning processes

3. What two characteristics influence the effectiveness of reinforcement of desired behaviors?

- a. Type of reinforcement—positive reinforcement is more efficient in achieving higher levels of safety performance than forms of disciplinary action focusing on eliminating unwanted behaviors.
- b. Time between reinforcement and the associated behavior—the closer in time, the stronger the reinforcement's effect.

4. Whether an employee works safely depends on what three factors?

- a. The present situation—is the employee rushed, stressed, fatigued, or in poor health?
- b. Past experiences—were accidents avoided in the past? What amount of training does the employee have?
- c. Workplace and methods design—were the job procedures and work setting designed to promote safe and healthy behaviors?

5. What was Abraham Maslow's contribution to the study of motivation?

Safety professionals will find it easier to work effectively with employees when they realize that individuals seek to satisfy their own needs, and Maslow's hierarchy of needs is one model that can be used to help identify those needs. The theory proposes that, in a person's life, there are five specific stages, or needs, that serve to motivate or provoke an individual to act. These include: physiological needs, security needs, social needs, ego needs, and self-actualization needs.

6. According to various types of studies and surveys, satisfaction of which of the following is the major motivational aspect of job satisfaction?

- c. psychosocial needs

7. McGregor discovered two basic ways in which managers view workers. Give a brief description of each.

- a. *Theory X* assumes that workers are essentially uninterested and unmotivated to work. In order to change this attitude, management must motivate workers through various external motivators such as rewards or punishments. This management approach uses both positive and negative outcomes.
- b. *Theory Y* assumes that workers have the potential to be interested and motivated to work. In fact, work is assumed to be as natural and desirable as other forms of human activity, such as sleep and recreation.

8. What did Herzberg theorize to be the most effective concept of motivation in the workplace?

- a. job enrichment

9. What are the three components of attitude?

- a. affective/feeling
- b. cognitive/knowing
- c. action

10. On what does a person's response or attitude usually depend?

A person's response or attitude usually depends partly on the individual's previous experiences.

11. List four of the seven principles of job enrichment.

- a. Organize the job to give each worker a complete and natural unit of work.
- b. Provide new and more difficult tasks to each worker.
- c. Allow the worker to perform specialized tasks in order to provide a unique contribution.
- d. Increase the authority of the worker.
- e. Eliminate unneeded controls on the worker while maintaining accountability.
- f. Require increased accountability of the worker
- g. Provide direct feedback

12. Briefly explain the difference between behaviors and attitudes.

Attitudes refer to internal predispositions to behavior; as such, they are difficult to observe and measure.

Behavior refers to observable actions, which can be measured. This distinction is vitally important because measurement of behaviors lays the groundwork for effective safety management. Although attitudes are difficult to affect directly, changing behavior is not as difficult.

13. List 7 of the 10 principles of learning.

- a. reinforcement
- c. knowledge of results
- d. practice
- e. meaningfulness
- f. selective learning
- g. frequency
- h. recall
- i. primacy
- j. intensity
- k. transfer of knowledge

CHAPTER 31—SAFETY AND HEALTH TRAINING

1. List four benefits of safety and health training.

Answers may vary. Examples include increased awareness, increased skill level, reduced complacency, increased employee satisfaction, improved performance, reduced employee turnover, decreased severity rate, improved productivity.

2. Identify 7 of the 12 nontraining solutions that can be as effective as a training program.

- a. Task procedures
- b. Safety data sheets (sdss)
- c. Flowcharts
- d. Checklists
- e. Diagrams
- f. Troubleshooting guides
- g. Decision tables
- h. Reference manuals
- i. Help desks or hotlines
- j. Employee incentives
- k. Improved physical work environments
- l. Improved work processes/workflow redesign

3. Define *performance-based training*.

Performance-based training is a learning experience (training) that is implemented to encourage a specific behavioral change or to solve a specific on-the-job problem. Performance-based training can be measured or evaluated by analyzing a worker's performance.

4. What are the five phases of the systematic approach of performance-based training?

- a. Analysis/identify
- b. Design
- c. Develop
- d. Implement
- e. Evaluate/maintain

5. Adults learn best through which of the following senses?

- d. all of the above

6. Describe the four adult learning principles that should be applied to all safety and health training.

- a. Need to know why (WIFM): Adults need to know why they are learning a particular topic or skill because they need to apply learning to immediate, real-life challenges. This is also known as the WIFM statement, or "What's in it for me?"
- b. Need to apply experience: Adults have experience that they apply to all new learning.

- c. Need to be in control: Adults need to be in control of their learning.
- d. Need for success: Adults want to learn things that will make them more effective and successful.

7. List the three most common types of training methods used in the industry.

- a. On-the-job training
- b. Group methods
- c. Individual methods

8. Group training encompasses which of the following techniques?

- e. all of the above

9. Define *computer-assisted training*.

Computer-based training (CBT) or *web-based training* (WBT) use interactive computer programs that enable workers to receive information by reading and/or watching a video presentation and then responding to situations and questions via a computer-based device.

10. List the five steps in the ADDIE system or training cycle.

- a. Analysis
- b. Design
- c. Development
- d. Implementation
- e. Evaluation

CHAPTER 32—MEDIA

1. Define *medium* and its purpose.

Medium is a channel of communication. Its purpose is to carry information between a source and a receiver, such as television, films, diagrams, printed materials, computers, the Internet, and trainers.

2. To be effective, media should target what human senses the most?

To be effective, media should take advantage of the two senses people use most when learning—sight and hearing.

3. What are the benefits of computer-based training?

- More efficient learner-centered training—students proceed at their own learning rates.
- More timely training—a training module can be given to a student whenever he or she needs it.
- Increased student-to-instructor ratio—one instructor can monitor more students who are using computers than is possible in a conventional classroom setting if enough computer workstations are available in one location.

4. How do evaluations help trainers and their use of media?

Evaluation helps designers and trainers get the maximum benefit from the time and effort they have spent in creating and using media materials. It gives them a sense of how they are doing and what areas need improvement.

5. What should trainers take advantage of to be most effective?

To be most effective, trainers should take full advantage of attention-getting devices, such as pointers, easels, charts, and teleprompters.

6. How does management justify the cost of training?

To determine whether the cost of a training medium is justified, management must consider what the expenditure will buy, how quickly the material will be outdated, how it will be used, and how many students will view it. A bottom-line cost for a single medium never tells the whole story; management must always rely on personal judgment to determine whether the return on investment (ROI) is appropriate for the organization and its needs.

7. Name four of the five factors to consider in deciding between commercial and in-house training materials?

- Number of showings
- How many people will be delivering the training
- The size and composition of the audience
- The degree of customization
- Importance of the message

8. In computer learning formats, what two types of interactive materials are often stressed?

- conceptualization
- simulation

9. How many colors should be used in a visual?

When using computer presentation software to generate text charts and graphs, limit color combinations to no more than four colors in a projected visual.

10. What are some disadvantages to using slides in a presentation?

- Slides with dark type on a white background are difficult to read and should be avoided.
- Remember that approximately 10% of the population has difficulty distinguishing the colors red and green
- If lettering or graph markings are in either color, such persons will see them only as varying shades of gray, and the impact of the message will be lost.
- Slides that look good on a slide sorter may be under- or overexposed when seen on the actual screen to be used at the meeting.

11. Should personal protective equipment be used by a photographer when working to create training media?

Photographers, their helpers, and everyone else who goes into an area where personal protective equipment is required for the purpose of taking safety photos must wear all the equipment specified, even though it may appear that they personally face little risk of injury.

CHAPTER 33—SAFETY AWARENESS PROGRAMS

1. What is the main objective of a safety awareness program?

The main objective of a safety awareness program is to maintain interest in safety by involving management and employees in accident prevention.

2. What are five factors a safety and health professional needs to consider when developing a safety awareness program?
- Company policy and experience
 - Budget and facilities
 - Types of operations
 - Types of employees
 - Basic human-interest factors for promotional activities
3. List three indications of the need for a safety awareness program.
- An increased rate of injuries, accidents, and near accidents
 - Deteriorating housekeeping
 - Incomplete or missing accident reports, indicating decreased supervisory interest
4. Which of the following can help to stimulate worker interest in safety and health policies and procedures?
- all of the above
5. List five ways to make a contest successful.
- Contests must be planned and conducted by a committee representing all competing groups.
 - Competing groups must be composed of natural units.
 - Methods of grading must be simple and fair.
 - Awards must be worth winning.
 - Contests should be well publicized and promoted.
6. Name the three broad categories of posters.
- General posters concerned with broad safety topics
 - Special industry posters that apply only to specific industries
 - Special hazard posters emphasizing particular hazards

7. When working with local media, what five tips should the safety and health professional keep in mind?
- Keep press releases brief, timely, accurate, and complete.
 - Be familiar with the publication or radio/TV station and know which editor or news director to contact.
 - Tailor press releases for the audience.
 - Include captions with photographs.
 - Leave script writing to the professionals, but make sure all facts are accurate.
8. What are the four steps the company should take in planning to start internal and/or external publications?
- Clearly define the objectives and purpose of the publication.
 - Determine how general or restricted the message will be.
 - Decide what form of publication is best.
 - Estimate costs of preparing and printing the publication.
9. When a serious incident occurs at a facility or company, who must work together to provide information about the incident?
- Public relations and the safety professional
10. To be successful, a public relations program must be actively supported by which of the following?
- all of the above