2.1. For the year a firm with 30 employees has two injuries, one of which involved lost workdays, and four illnesses, all of which involved lost workdays. Calculate the LWDI.

ANS: \[
\frac{1 \times 200,000}{30 \times 2000} = 3.33
\]

ref. p. 19-21

2.2. Calculate the LWDI for a firm that has 40 employees and for the year has had 12 work-related injury cases, each involving one or more lost workdays?

a. 12
b. 30
c. 16.5
d. indeterminate from the data supplied.

ref. p. 19-21

2.3. Calculate the LWDI for a firm that has 15 employees and for the year has had 11 work-related injury cases, each of which involved one or more lost workdays?

a. 73.3
b. 36.5
c. 8.6
d. indeterminate from the data supplied.

ref. p. 19-21

2.4. A 65-employee firm has the following injury and illness record for the year:

Case 1 - Work-related injury; no workdays lost
Case 2 - Work-related illness; 5 days away from work
Case 3 - Work-related injury; one workday away from work; nine more days in restricted work activity
Case 4 - Injury; able to stay at work, but for two weeks employee was unable to do regular job and was assigned to another one.
Case 5 - Illness; not work-related

a. Calculate the LWDI.

ANS: \[
\frac{2 \times 200,000}{65 \times 2000} = 3.08
\]

b. Calculate the total injury/illness incidence rate.

ANS: \[
\frac{(1 + 3) \times 200,000}{65 \times 2000} = 6.15
\]

c. Calculate the number-of-lost-workdays rate.

ANS: \[
\frac{5 + 1 + 9 + 10}{65 \times 200,000} = 38.46
\]

ref. p. 19-21

2.5. The standard OSHA total injury/illness rate is scaled for:

a. 1,000,000 work-hours
b. a 50-employee firm for one year
c. a 100-employee firm for one year
d. a 500-employee firm for one year

ref. p. 19

2.6. Comment on the advantages and disadvantages of forming committees to identify hazards and make suggestions for resolution of these hazards.

ANS: Committees have the advantage of getting the production and operating personnel involved, because these are the people who know the hazards best within their work areas. Another advantage is that the committee approach gets more people involved throughout the plant, so that it generates more exposure to the safety/health program. Also, when changes to promote safety and health are carried out, the changes will be accepted more readily by plant workers if those same workers had a hand in suggesting the changes. A disadvantage is that workers may have unrealistic expectations and then be disappointed when management does not implement some of the committee suggestions, which may at times be impractical. Also, committees can sometimes degenerate into spy parties that bring discredit upon other competing departments.

ref. p. 31-32
2.7. On February 1, a firm posts its annual OSHA 300A Summary for the previous year as shown below.

For purposes of this exercise, assume that both of the illnesses (listed in M(5)) were in the category of lost workdays (Category H - cases with days away from work).

Calculate:

(a) LWDI:

ANS: To arrive at the number of cases to count in the LWDI subtract the illness cases out of the total in Category H, i.e., 6-2 = 4.

\[
LWDI = \frac{4 \times 200,000}{100,000} = 4 \times 2 = 8
\]

(b) Illness incidence rate:

ANS.

\[
\text{Illness-incidence} = \frac{2 \times 200,000}{100,000} = 2 \times 2 = 4
\]

(c) Fatality incidence rate:

ANS.

\[
\text{Fatality-incidence} = \frac{1 \times 200,000}{100,000} = 1 \times 2 = 2
\]

(d) Number-of-lost-workdays rate:

ANS.

\[
\text{Number-of-lost-workdays rate} = \frac{(21 + 12) \times 200,000}{100,000} = 3.3
\]
2.8. The text describes a type of analysis that is said to be the "single most effective method of training workers to avoid injury and illness." Name this analysis and describe its advantages and its primary disadvantage.

ANS: "Accident cause analysis" is advantageous in that it shows workers what has already happened to their co-workers. It is advantageous even for those accidents that do not result in injuries, because even no-injury accidents are unwanted events that next time might cause injuries. The analysis can lead to design changes to product, process, or work procedures. The primary disadvantage is that the analysis is too late to prevent the accident being studied.

2.9. Place an entry in the attached OSHA 300 Log for the following Case File. If the case file is not recordable write "Not recordable" on the line.

Case File 11--Tenosynovitis victim undergoes carpal tunnel surgery. The employee is away from work all day Tuesday, May 6, and returns to work Friday morning, May 9, at the regular time for her shift. However, due to the surgery she is given an alternate job beginning on the Friday that she returns to work, and she stays on that alternate job until Monday morning, June 2, when she returns to her regular job.

ANS: The Case File 11 entry should read:

Note that Column H was checked because being away from work is considered a more serious result than Column I, "job transfer or restriction." Since the worker was away from work all day Tuesday, Wednesday, and Thursday, Column L shows 3 days away from work. From Friday, May 9, she remains in her alternate job assignment until Monday, June 2. Counting all the days INCLUDING weekends in this alternate job, she was in "job transfer or restriction" a total of 24 calendar days, so the entry in Column K is 24. Since tenosynovitis can not be classified as an injury or skin disorder or respiratory condition or poisoning, it is classified as "All other illnesses," Column M(5).
2.10. Examine the OSHA 300 Log and construct the OSHA 300a Summary of Work-Related Injuries and Illnesses on the form provided. Assume that this firm has 200 employees and all employees worked for the entire year. Calculate the LNDI.

ANS:

<table>
<thead>
<tr>
<th>Body affected, injured</th>
<th>Using these four categories, check ONLY the most serious result for each case</th>
<th>Enter the number of days the injured or ill worker was</th>
</tr>
</thead>
<tbody>
<tr>
<td>Death</td>
<td>( ) Days away from work</td>
<td>( ) Remainder of work</td>
</tr>
<tr>
<td></td>
<td>Death</td>
<td>Days away from work</td>
</tr>
<tr>
<td></td>
<td>Death ( ) Days away from work ( ) Remainder of work</td>
<td>( ) On job transfer or relocation ( ) Other recordable exposure</td>
</tr>
<tr>
<td></td>
<td>( ) Days away from work</td>
<td>( ) Remainder of work</td>
</tr>
<tr>
<td></td>
<td>( ) Days away from work</td>
<td>( ) Remainder of work</td>
</tr>
<tr>
<td></td>
<td>( ) Days away from work</td>
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<td></td>
<td>( ) Days away from work</td>
<td>( ) Remainder of work</td>
</tr>
<tr>
<td></td>
<td>( ) Days away from work</td>
<td>( ) Remainder of work</td>
</tr>
</tbody>
</table>

Page totals:

Page of

ANS:
OSHA's Form 300A
Summary of Work-Related Injuries and Illnesses

At Establishments covered by Part 1904 must complete this Summary page, even if no work-related injuries or illnesses occurred during the year. Remember to review the Log to verify that the entries are complete and accurate before completing this summary.

Using the Log, count the individual entries you made for each category. Then write the totals below, making sure you've added the entries from every page of the Log. If you had no cases, write 0.

Employees, former employees, and their representatives have the right to review the OSHA Form 300 in its entirety. They also have limited access to the OSHA Form 301 or its equivalent. See 29 CFR Part 1904.35, OSHA's recordkeeping rules, for further details on the access provisions for these forms.

<table>
<thead>
<tr>
<th>Number of Cases</th>
<th>Total number of deaths</th>
<th>Total number of cases with days away from work</th>
<th>Total number of cases with job transfer or restriction</th>
<th>Total number of other recordable cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>(3)</td>
<td>(3)</td>
<td>(1)</td>
<td>(5)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Number of Days</th>
<th>Total number of days of job transfer or restriction</th>
<th>Total number of days away from work</th>
</tr>
</thead>
<tbody>
<tr>
<td>(4)</td>
<td>(3)</td>
<td>(6)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Injury and Illness Types</th>
<th>Total number of...</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Injuries</td>
<td>(4) Poisonings</td>
</tr>
<tr>
<td>(2) Skin disorders</td>
<td>(5) All other illnesses</td>
</tr>
<tr>
<td>(2) Respiratory conditions</td>
<td>1</td>
</tr>
</tbody>
</table>

Post this Summary page from February 1 to April 30 of the year following the year covered by the form.

Public reporting burden for this collection of information is estimated to average 15 minutes per response, including time to review the instructions, search the data needed, and complete and submit the collection of information. Persons are not required to respond to the collection of information unless it displays a currently valid OSHA control number. If you have any comments about this form or any other aspects of this data collection, contact: U.S. Department of Labor, OSHA Office of Management, Room N1441, 200 Constitution Avenue, NW, Washington, DC 20210. We will send the completed form to this office.

\[ LWDI = \frac{4 \times 200,000}{200 \times 2000} = 2 \]

ref. p. 21-29
2.11 What method of training is considered most effective?
ANS: Accident cause analysis and subsequent dissemination of information to personnel.

2.12. Describe the fatality case study presented in the text in which the fatality would have been easily prevented by accident cause analysis of a previous near-fatality which occurred only a week earlier.
ANS: Case study 2.2 describes a fatality that occurred when an employee was struck by a large wrench while opening a railroad hopper car. A similar accident had occurred only week earlier without injury. Had the first accident been analyzed, corrective action could easily have prevented the fatality the very next week.

2.13. What is the principal disadvantage of accident cause analysis?
ANS: It is the after-the-fact.

2.14. What specific OSHA reform concept was introduced into Congress in the early 1990’s?
ANS: Mandatory safety and health programs with employer/employee committees to address safety and health issues.

2.15. Briefly summarize the findings of the 1993 NSC study regarding a specific issue of OSHA reform.
ANS: The study addressed the question of the committees and whether employees should be involved in a company’s safety and health program. The majority response was that employee involvement and committees are essential.

2.16. Recent estimates by the National Safety Council place the annual cost of U.S. occupational injuries alone at approximately
   a. 100 million
   b. 1 billion
   c. 100 billion
   d. 1 trillion

2.17. What organization estimates the annual costs of occupational injuries on a national basis, and what are recent estimates of this figure.
ANS: The National Safety Council estimates these costs and reports them in their annual publication Injury Facts. Recent estimates place total annual costs for occupational injuries alone at over $132 billion. (ref: Injury Facts, 2002 edition, reporting 2001 statistics)

2.18. Studies by Simonds and Grimaldi and Imre estimate hidden costs of accidents by dividing cases into four categories. Name these categories of hidden costs:
ANS: 1. First-aid cases
     2. Doctors’ cases
     3. Lost-time cases
     4. No-injury cases

2.19. What is the National Safety Council estimate of the average total cost of a worker fatality?
ANS: $790,000

2.20. Workers Compensation premiums are a significant portion of the hidden costs of accidents.
   a. True
   b. False
2.21. Workers Compensation premiums have grown in recent years to become a more significant percentage of total payroll.
   a. True
   b. False
   ref. p. 33

2.22. Despite significantly higher premium rates for Workers' Compensation insurance in recent years, these costs are still considered as the “tip of the iceberg” when considering the total costs of accidents.
   a. True
   b. False
   ref. p. 34

2.23. The hidden costs of accidents are considered the “tip of the iceberg” when compared to the rising levels of Workers’ Compensation costs.
   a. True
   b. False
   ref. p. 34

2.24. Due to recent significant increases, Workers’ Compensation costs have been found to exceed the hidden costs of accidents.
   a. True
   b. False
   ref. p. 34

2.25. Which of the following cost categories is referred to in the text as the “tip of the iceberg?”
   a. Workers Compensation costs
   b. Hidden costs of accidents
   c. OSHA fines
   d. Cost of compliance with OSHA standards
   e. None of the above
   ref. p. 34

2.26. Which of the following costs are covered by Workers Compensation insurance?
   a. Cost of wages paid supervisors for time required for activities necessitated by the accident.
   b. Overtime wages for the time needed to make up lost production.
   c. Wage cost caused by decreased output of injured worker after return to work.
   d. All of the above
   e. None of the above
   ref. p. 33-35

2.27. What two facets of a drug or alcohol abuse program are suggested by the text?
   ANS: 1. Screening tests
         2. Employee assistance programs
         ref. p. 38

2.28. What 1990 law protects disabled persons from job discrimination?
   ANS: The Americans with Disabilities Act (ADA)
         ref. p. 39

2.29. Name the two infectious viruses that are the target of OSHA's Bloodborne Pathogens standard.
   ANS: 1. Human Immunodeficiency Virus (HIV) (also called "AIDS" virus)
         2. Hepatitis B virus (HBV)
         ref. p. 41

2.30. The primary at-risk occupations for bloodborne pathogens are the health care professions.
   a. true
   b. false
   ref. p. 41
2.31. OSHA limits its enforcement of the Bloodborne Pathogens standard to the health care professions.
   a. true
   b. false

2.32. Explain the circumstances under which OSHA prohibits the handling of contact lenses, and explain why.
   ANS: In work areas that might be exposed to bloodborne pathogens. The reason is potential exposure to HIV or HBV viruses.

2.33. Under what circumstances does OSHA require the employer to have a written exposure control plan for bloodborne pathogens?
   a. Only in hospitals and health care facilities.
   b. Only in establishments that have 10 or more employees who may be exposed.
   c. Only in establishments that have 1 or more employees who may be exposed.
   d. None of the above; a written plan is not required.

2.34. Dealing with "sharps" is a principal consideration in which of the OSHA standards?
   ANS: The Bloodborne Pathogens standard

2.35. Describe the circumstances under which an employer should be concerned with the development of a written exposure control plan for bloodborne pathogens.
   ANS: Whenever the employer has one or more employees who may encounter occupational exposures to bloodborne pathogens, such as HIV or HBV viruses.

2.36. Which of the following is the principal question to be asked to determine whether a firm is covered by OSHA's Bloodborne Pathogens standard?
   a. Does the firm have 10 or more employees?
   b. Is the firm a hospital, clinic, or other healthcare facility?
   c. Does the facility deal with "sharps," such as needles or broken glass?
   d. Will workers be exposed to blood or other potentially infectious materials?

2.37. The Workers’ Compensation premium rates, as a percent of payroll, are greater for roofing workers than for department store workers, as might be expected. The ratio of these percentages is approximately
   a. two to one
   b. three to one
   c. ten to one
   d. 100 to one

2.38. What is the principal hazard from improper disposal of “sharps” in the workplace?
   ANS. Exposure to HIV infection

2.39. Which of the following statements describes the status of the control of smoking in the workplace?
   a. OSHA has issued a final standard entitled "Indoor Air Quality" that addresses smoking and other air quality hazards in the workplace.
   b. Smoking in the workplace comes under the jurisdiction of the EPA, not OSHA
   c. OSHA has issued guidelines and proposed air quality standards, but has not promulgated a standard addressing smoking in the workplace.
   d. Congress exempted smoking in the workplace in the drafting of OSHA's authority under the OSHA law.
2.40. Explain the concept of "experience modifier" as used in the context of this course. Exactly what is modified? Give an example of a "good" and a "bad" experience modifier. Finally, illustrate the application of the experience modifier in a fictitious numerical example.

ANS. The experience "modifier" or "rating" is a factor multiplied by the standard insurance premium for Workers Compensation insurance. The factor adjusts the premium based upon the firm's record of claims for injuries and illnesses. A factor higher than 1.00 would be a "bad" experience modifier, because the firm's insurance premium would be higher than standard. A factor lower than 1.00 would be a "good" modifier, because the firm's insurance premium would be lower, due to its good past record. For example:

Standard insurance premium: $80,000  
Experience modifier: 0.85  
Actual premium to be paid = $80,000 x 0.85 = $68,000  

2.41. The standard insurance premium for a firm in a particular industry is $760,000 per year, based upon its type of industry and number of employees. However, the firm has an "experience modifier" of 0.95. Calculate the adjusted insurance premium for this firm.

ANS. Insurance premium = 0.95 x 760,000 = $722,000  

2.42. What size firm are the OSHA recordkeeping incidence rates scaled to represent? Explain.

ANS. The OSHA recordkeeping formulas can be used for any size firm because the denominator in the calculation relates the incidence counts to the number of hours worked by employees in the firm. The numerator scales this rate by multiplying by a constant of 200,000, which is typical for a 100-employee firm in which the employees each work approximately 2000 hours per year (100 x 2000 = 200,000). Therefore the incidence rates are scaled to represent a 100-employee firm.

2.43. A firm is exempt from OSHA recordkeeping requirements only if:

a. It has been notified by the BLS that it is exempt.
b. It has 10 or fewer employees AND it has been told by BLS that it is exempt.
c. It has 10 or fewer employees AND it has NOT been told by BLS that it is not exempt.
d. Never. OSHA recordkeeping is required for ALL firms.