

## 16 ERGONOMICS YESTERDAY, TODAY, AND TOMORROW

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### QUIZ 1 (20 POINTS TOTAL)

#### *True/False (5 points)*

1. Research in the field of biomechanics has contributed to industry's understanding of work-related stresses and solutions.
  - a. true
  - b. false
2. Mental demands often receive the most attention because of the aging workforce in the United States.
  - a. true
  - b. false
3. If a worker wears gloves, his or her muscles must exert more force to maintain adequate grasp due to reduced tactile feedback.
  - a. true
  - b. false
4. Abduction of the shoulders is movement of the shoulders toward the midline of the body.
  - a. true
  - b. false
5. If a display has a pointer that moves clockwise to show an increase, then its control mechanism should be designed so that a counterclockwise movement will increase the corresponding output value.
  - a. true
  - b. false

#### *Multiple Choice (6 points)*

6. Which of the following is not a physical demand put on workers?
  - a. sitting all day
  - b. pressing control buttons
  - c. making mental calculations
  - d. carrying a tote bag
7. Poor ergonomic design can result in
  - a. high training costs.
  - b. medical restrictions.
  - c. personnel turnover.
  - d. all of the above
8. Highly repetitive jobs are those with a cycle time of less than
  - a. 15 seconds.
  - b. 30 seconds.
  - c. 45 seconds.
  - d. 1 minute.

9. Which of the following are examples of static work?
  - a. working with the arms extended
  - b. looking sideways for sustained periods
  - c. holding things with the hands
  - d. all of the above
10. The designer of a control panel wants to group the keys for a particular operation and make them easily identifiable at first glance. Which of the following techniques would be best?
  - a. coding by color
  - b. coding by shape
  - c. coding by location
  - d. coding by texture
11. One way to reduce awkward posture might be to
  - a. keep tools properly maintained.
  - b. use mechanical aids to get parts.
  - c. reduce the weight to be handled.
  - d. allow the worker to control the pace of the job.

***Short Answer (7 points)***

12. What does MSD stand for and what kinds of conditions does it involve?
13. What are some frequently reported nonoccupational risk factors of MSDs, and especially of CTS?
14. What is the recommended method for obtaining data for active surveillance of MSDs in the workplace?
15. What factors influence the rate at which muscular fatigue develops?

16. What are the main issues to be considered when evaluating repetitive work?
  
  
  
  
  
  
  
  
  
  
17. Why are engineering controls the preferred method for controlling hazards?
  
  
  
  
  
  
  
  
  
  
18. A medical management program is essential in eliminating the risk of MSDs. What are three issues that this kind of program should address?

***Short Essay (2 points)***

19. What are the five goals of ergonomics? What is another way of describing ergonomics?
  
  
  
  
  
  
  
  
  
  
20. A comprehensive and systematic evaluation is required to quantitatively evaluate MSDs in the workplace. Several methods are available to do this. What are they?

**QUIZ 2 (20 POINTS TOTAL)**

***True/False (5 points)***

1. An ergonomist believes that machine, raw materials, and end products comprise a complete system.
  - a. true
  - b. false

2. Work organization, pace, and need for overtime are factors that contribute to a worker's psychosocial environment.
  - a. true
  - b. false
  
3. An effective ergonomics program takes more of a proactive than a reactive approach and involves all affected personnel.
  - a. true
  - b. false
  
4. Repetitiveness is usually a more important factor than force for inducing MSDs.
  - a. true
  - b. false
  
5. One way to reduce repetition is to use power tools.
  - a. true
  - b. false

**Multiple Choice (6 points)**

6. Historically, ergonomics in the United States was concentrated in the \_\_\_\_\_ programs.
  - a. engineering and psychological
  - b. military and aerospace
  - c. anatomy and physiology
  - d. industrial and electronics
  
7. What of the following is a common MSD?
  - a. tendinitis
  - b. bursitis
  - c. epicondylitis
  - d. all of the above
  
8. Which of the following is not an environmental demand?
  - a. the vibration of a machine
  - b. the need to carry a tool
  - c. the temperature of a workspace
  - d. the airflow in an area
  
9. When typing on a conventional keyboard, a worker has to force his or her hands to be flat to remain in full contact with the keyboard. What is this posture called?
  - a. supination
  - b. ulnar deviation
  - c. pronation
  - d. flexion

10. While typing at a computer workstation, it is recommended that the angle of a worker's elbow be between
- 87 and 90 degrees.
  - 92 and 95 degrees.
  - 95 and 98 degrees.
  - 100 and 103 degrees.
11. Exposure to temperatures less than \_\_\_\_\_ can reduce manual dexterity and, therefore, lead to injury.
- 63 F
  - 61 F
  - 57 F
  - 55 F

**Short Answer (7 points)**

12. What is another name for ergonomics?
13. The demands placed on a worker fall into three categories. What are they?
14. Most workers in the United States expect to turn on a light by flipping the switch up. This is an example of \_\_\_\_\_.
15. What are the three main questions that need to be asked when performing an ergonomic analysis of a materials handling task?

16. When is it useful to code controls using shape and texture?
  
  
  
  
  
  
  
  
  
  
17. If a worker notifies his employer that he has a disability, what may the ADA require of the employer?
  
  
  
  
  
  
  
  
  
  
18. Clearance and accessibility issues are most critical for which group of workers?

***Short Essay (2 points)***

19. Passive and active surveillance can be helpful in identifying work areas with potential for MSDs. What is passive surveillance and what does it involve?
  
  
  
  
  
  
  
  
  
  
20. To evaluate existing auditory or visual displays what issues should management take into consideration?