

2 BUILDINGS AND FACILITY LAYOUT

ANSWERS—QUIZ 1

1. b
2. b
3. a
4. a
5. b
6. a
7. b
8. c
9. b
10. c
11. a
12. c
13. Student might mention the following: illumination, noise and vibration control, product flow, ventilation, control of temperature and humidity, work positions and movements of employees, supervision and communication, support requirements for such things as vehicles, portable ladders, material handling devices, monitoring and controlling systems, and cleaning and maintenance equipment.
14. Student might mention the following: construction and procedures; visual displays, signs, and labels; protective features and guards; controls and handles; maintenance and service needs; and safety signs.
15. A fence keeps out trespassers who may interfere with work or be injured on the property. Fencing also protects employees and others from transformer stations, pits, sumps, stream banks, and similar dangerous places.
16. Angle parking has both advantages and disadvantages. The smaller the angle, the fewer the number of vehicles that can be parked in the same area. Aisle widths can be narrower, but traffic is usually restricted to one way. However, angle parking is easier for drivers and does not require a lot of space for sharp turns.
17. Student may use examples from the text: Chemical wastes should be rendered harmless before disposal. Combustible materials may be burned in an incinerator, providing it conforms with applicable laws, is safely located, and properly attended.
18. The effectiveness of tall stacks depends on the nature and volume of the gases, the location of the facility,

- the prevailing wind direction, and atmospheric conditions. Rain may absorb harmful gases and cause heavy damage to crops and the environment.
19. A confined space is any area that is not designed for continuous human occupancy. It has limited access and ventilation. It is also susceptible to hazards such as inundation of water, gas, or solid particulate. Or, it may have sloping sides that lead to a crusher, auger, or restriction. Other hazards include bridging of material, electrical hazards, oxygen deficiency, falling from an elevation, radiation, toxic gas or vapor, and fire or explosion.
 20. The essay will probably mention the following topics from the text: When planning a site for a facility, consider the following: the relationship of the new structures to climate and terrain; necessary disposal facilities; transportation to and from facilities; market; labor supply; and hazards to the community.

ANSWERS—QUIZ 2

1. a
2. a
3. b
4. a
5. a
6. a
7. d
8. b
9. b
10. a
11. b
12. Student might mention the following: the nature of the business and processes; the nature of the production materials; maintenance; mechanical handling equipment; climate; working conditions; shipping and receiving materials; economic considerations; personnel facilities.
13. Student must name two of the following four: floodlights, streetlights, Fresnel lens units, and searchlights.
14. Student may mention any of the following: Secure all windows; use protective lighting; have entrances and service doors lead to a reception area; install alarm systems that detect fire, fumes, vapors, and intruders; limit access to docks and other receiving areas.
15. Light has an effect on color, and color also affects the

quality of light. When dealing with surface colors, this effect on light is called the light reflectance value (LRV) of color. It is an important property because the reflections from painted surfaces act as secondary light sources. With proper color styling and recommended reflectances, work area surfaces will maximize the available light and reduce shadows.

16. When selecting a flooring material, consider load, durability, maintenance, noise, dustiness, drainage, heat conductivity, resilience, electrical conductivity, appearance, chemical composition, and slip-resistance.
17. Student might mention the following: Place controls where they require the least amount of movement. Provide lighting that is suitable to the task. Provide jigs and fixtures that relieve pressure. Provide a workbench so that workers may either sit or stand as needed. Determine workflow patterns that are normal and easy for the worker. Provide audio and/or visual signals for machine operators. Preposition materials, equipment, products, and tools. Place tools, controls, and materials in the employee's direct line of vision. Provide arm motions that are smooth and continuous, not straight, irregular, and sudden. Design the workflow so that the work process moves smoothly.
18. Student must write a summary of four of the floor materials as described on pages 73-75 of Chapter 2.

4. The answer should discuss problems in terms of quantity and quality of illumination and the need for artificial light sources.

ANSWERS—CASE STUDY

1. The student's answer should be "no," and student may go on to support that theory.
2. Some of the general questions to ask before tackling specific design decisions include the following: What will workers do? How should workers do it? Where should workers do it? Why should workers do it? What can happen to workers who do it?
3. Some of the factors to consider for the general design of the workplace include the following: illumination, noise and vibration control, product flow, ventilation, control of temperature and humidity, work positions and movements of employees, supervision and communication, support requirements for such things as vehicles, portable ladders, materials handling devices, monitoring and controlling systems, and leaning and maintenance equipment.