

Exam

Name\_\_\_\_\_

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

- 1) A building code regulates
- A) the design of the building.
  - B) the construction of the building.
  - C) the aesthetics of the building.
  - D) all of the above.
  - E) both A and B.

Answer: E

TRUE/FALSE. Write 'T' if the statement is true and 'F' if the statement is false.

- 2) In a building code, some life safety provisions are contained in fire safety provisions and the remaining ones in structural safety provisions.

Answer: True ☒ False

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

- 3) The building code requirements for the dimensions of treads and risers of a staircase are
- A) property protection issues.
  - B) structural safety issues.
  - C) fire safety issues.
  - D) health and welfare issues.
  - E) life safety issues.

Answer: E

- 4) The building code requirements for the means of egress from a building are primarily
- A) life safety issues.
  - B) property protection issues.
  - C) fire safety issues.
  - D) health and welfare issues.
  - E) structural safety issues.

Answer: C

- 5) The enforcement of a building code is usually done at the level of the
- |  |   |
|--|---|
| A) country in which the building is located. | B) county in which the building is located. |
| C) state in which the building is located.   | D) city in which the building is located.   |

Answer: D

- 6) The person in charge of enforcing the building code is generally called a
- A) code in-charge.
  - B) building official.
  - C) building code representative.
  - D) building code spokesperson.
  - E) none of the above.

Answer: B

- 7) Before commencing the construction of a building, the owner must apply to the city to obtain a
- A) construction permit.
  - B) building license.
  - C) commence work order.
  - D) building permit.

Answer: D

- 8) To ensure that the construction of the building is being done in accordance with the building code, the city will arrange for its inspection
- A) two times during construction.
  - B) several times during construction.
  - C) three times during construction.
  - D) only once during construction.

Answer: B

- 9) If during the construction of the building, the building inspector discovers a gross violation of the building code, he or she will generally
- A) issue a warning to the owner.
  - B) issue a stop work order to the owner.
  - C) invite the owner for a meeting.
  - D) issue arrest warrant against the owner.
  - E) take the owner to the appropriate court of law.

Answer: B

TRUE/FALSE. Write 'T' if the statement is true and 'F' if the statement is false.

- 10) The board of appeals of the city does not have the authority to change building code provisions.

Answer: ☒ True      False

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

- 11) In the case of a dispute between the building official and the owner about the interpretation of a building code provision, the matter is first resolved by
- A) an independent arbitrator mutually agreed to between the owner and the city.
  - B) the owner's architect.
  - C) the city attorney.
  - D) an ad hoc committee appointed by the city.
  - E) none of the above.

Answer: E

TRUE/FALSE. Write 'T' if the statement is true and 'F' if the statement is false.

- 12) A prescriptive building code provision is easier to enforce than a performance provision.

Answer: ☒ True      False

- 13) Performance-type building code provisions inhibit the use of innovative building materials and construction systems compared with prescriptive type provisions.

Answer: True      ☒ False

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

- 14) Writing and periodically updating the building code in the United States is generally done by
- A) the federal government.
  - B) a specialized independent agency.
  - C) the individual city.
  - D) the individual state.

Answer: B

- 15) The International Building Code is published by the
- A) Building Officials and Code Administrators International.
  - B) International Conference of Building Officials.
  - C) North American Council of Governments.
  - D) U.S. government.
  - E) None of the above.

Answer: E

- 16) The International Building Code is generally updated every
- A) 2 years.
  - B) 3 years.
  - C) 4 years.
  - D) 5 years.
  - E) 10 years.

Answer: B

- 17) The adoption of a model building code in the United States is done at the level of
- A) the entire country.
  - B) each state.
  - C) each city.
  - D) either A or B.
  - E) either B or C.

Answer: E

- 18) The first step in applying the building code to a project is to
- A) determine the occupancy classification of the building.
  - B) determine the number of exits from the building at the ground floor.
  - C) determine the width of open spaces around the building.
  - D) determine if the building is provided with an automatic sprinkler system.

Answer: A

- 19) The total number of occupancies (excluding the divisions) as specified in the International Building Code is
- A) 6.
  - B) 10.
  - C) 12.
  - D) 8.
  - E) none of the above.

Answer: B

- 20) Which of the following is *not* a recognized building code occupancy?
- A) Educational
  - B) Assembly
  - C) Office
  - D) Institutional
  - E) Business

Answer: C

- 21) A hotel building is a
- A) hotel occupancy.
  - B) business occupancy.
  - C) mixed occupancy.
  - D) hospitality occupancy.
  - E) none of the above.

Answer: E

- 22) The International Building Code divides the types of construction into
- A) Types I, II, III, IV, and V.
  - B) Types U, V, X, and Y.
  - C) Types 1, 2, 3, 4, and 5.
  - D) Types I, II, III, IV, V, and VI.

Answer: A

- 23) The most fire resistive type of construction is  
A) Type I(A).      B) Type I.      C) Type 5(A).      D) Type V(A).      E) Type II.  
Answer: A

- 24) The International Green Construction Code (IGCC) is published by the  
A) Green Globes.  
B) ASTM International.  
C) International Code Council.  
D) United States Green Building Council (USGBC).  
E) Green Building Initiative (GBI).  
Answer: C

TRUE/FALSE. Write 'T' if the statement is true and 'F' if the statement is false.

- 25) A prescriptive code needs no standards.  
Answer: ☒ True      False

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

- 26) The construction standards used in building codes are produced by  
A) governmental organizations.  
B) trade associations.  
C) standards writing organizations.  
D) professional societies.  
E) all of the above.  
Answer: E

- 27) Which of the following is *not* a standards writing organization?  
A) NSF      B) UL      C) ASTM      D) ANSI  
Answer: A

- 28) Which of the following is the largest standards writing organization?  
A) NRCA      B) ANSI      C) ASCE      D) ASTM      E) UL  
Answer: D

- 29) The acronym UL stands for  
A) United Legislature.      B) Universal Laboratories.  
C) Underwriters Laboratories.      D) Union of Laborers.  
Answer: C

- 30) A zoning ordinance refers to regulations that pertain mainly to  
A) the use of buildings within the city.      B) the use of land within the city.  
C) the use of highways within the city.      D) none of the above.  
Answer: B

- 31) A zoning ordinance consists of
- A) the zoning map of the city.
  - B) the zoning text, zoning map, and the building code of the city.
  - C) the zoning text and the zoning map of the city.
  - D) the zoning text and the building code of the city.
  - E) the zoning map and the building code of the city.

Answer: C

- 32) The term FAR refers to
- A) floors as required.
  - B) factory area restrictions.
  - C) floor area ratio.
  - D) none of the above.

Answer: C

- 33) If the total area of a lot is 15,000 ft<sup>2</sup> and the total covered area on all floors of the building on this lot is 60,000 ft<sup>2</sup>, the FAR for the property is
- A) 0.25.
  - B) 1.5.
  - C) 3.7.
  - D) 6.0.
  - E) none of the above.

Answer: E

TRUE/FALSE. Write 'T' if the statement is true and 'F' if the statement is false.

- 34) The Americans with Disabilities Act (ADA) is devoted entirely to provisions relating to accessibility within a building.

Answer: True ☒ False

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

- 35) Before granting the building permit, the office of the building official of a jurisdiction must review the construction documents of the building for conformance with
- A) the requirements of the Americans with Disabilities ACT (ADA) passed by the federal government
  - B) the accessibility requirements of the jurisdiction's building code.
  - C) either A or B depending on the jurisdiction.
  - D) none of the above.

Answer: D

ESSAY. Write your answer in the space provided or on a separate sheet of paper.

- 36) What does the acronym "HSW" stand for?

Answer: Health, safety, and welfare.

- 37) In dealing with safety in buildings, the building codes classify safety under three types. Name them.

Answer: 1. Life safety; 2. Fire and smoke safety, and 3. Structural safety.

38) If a building has been designed to fully conform with the building code, the design team (architect and consultants) is fully protected from liability risk exposure. Is this statement true? Explain.

Answer: No, it is not true, because the building must comply with other laws and standards apart from the building code, such as the city's zoning laws and applicable construction standards. Additionally, the architect and the design team may be held accountable for breach of contract administration duties, such as not observing and disclosing errors made by the GC during the construction of the project, particularly if the errors were preventable through ordinary skill and attention.

39) A building code has provisions regarding the maximum and minimum dimension of treads and risers of a staircase. Are these primarily fire safety or life safety provisions?

Answer: Life safety provisions.

40) The means of egress system in a building is divided into three parts. List them.

Answer: 1. Exit access  
2. Exit  
3. Exit discharge

41) An exit staircase has an exterior door opening to a public street. Is it an exit, an exit access, or an exit discharge?

Answer: It is an exit.

42) What is a building permit and where is it obtained from?

Answer: A building permit means "permission to build," i.e., permission to start and continue construction. It is obtained from the city where the proposed building is located.

43) What does a city typically require from the owner in consideration of the grant of a building permit?

Answer: The city needs: (a) building permit application, (b) required fee, and (c) hard copies or a digital copy (or both) of the construction document (CD) set, depending on the city.

44) To ensure that the building is constructed per the provisions of the building code of the city and the approved CD set given by the city to the owner (as part of the building permit), the building is inspected at several stages by the city's building department. If during an inspection, a gross violation of a building code provision or of the approved CD set is discovered, what would the city normally do?

Answer: The city will issue a stop work order, asking for further construction to cease until the violation has been corrected and so approved by the city through an inspection.

45) What does a "certificate of occupancy" imply? Where is it obtained from and by whom—the GC or the architect of the project?

Answer: A certificate of occupancy implies that the building is (substantially) complete and is safe to occupy by the owner. It is obtained from the city (generally by the GC) after a detailed inspection by the city's building inspection department.

46) List (a) one advantage of a performance provision of the code over a prescriptive provision, and (b) one advantage of a prescriptive provision of the code over a performance provision.

Answer: (a) A performance provision gives freedom to choose building materials and assemblies as long as the code-prescribed performance requirements are met. In a prescriptive provision there is no such freedom.  
(b) A prescriptive provision is easier to interpret and conform to but lacks freedom to choose materials and assemblies.

47) Which organization in the United States publishes various codes related to the design and construction of buildings?

Answer: International Code Council (ICC)

48) Name at least four codes published by the International Code Council (ICC).

Answer: International Building Code (IBC), International Residential Code (IRC), International Mechanical Code (IMC), International Plumbing Code (IPC), and so on.

49) In designing the following residential buildings, should the architect refer to IBC or IRC: (a) a semi-detached 2-family dwelling, (b) a 3-story townhouse, (c) a 3-story apartment building?

Answer: (a) A semi-detached 2-family dwelling—IRC

(b) A 3-story townhouse—IRC

(c) A 3-story apartment building—IBC.

50) What does the term "IGCC" stand for?

Answer: International Green Construction Code.

51) Name the two most important items of information about the building you will need to determine its maximum allowable area and maximum allowable height.

Answer: 1. Building's occupancy classification

2. Building's type of construction

52) In a building code, what does the term "frontage" imply?

Answer: Frontage refers to the open space around the building that is accessible to a public way or street. It is measured as the distance of each side of the building's footprint from the lot line or the far side of the street (i.e., the width of the street is included in frontage).

53) In which situation is the open space provided by a courtyard within a building not considered as "frontage" by a building code?

Answer: When the courtyard is not accessible to a public way or street.

54) The Assembly occupancy group has five divisions—A-1, A-2, A-3, A-4, and A-5—which are recognized as separate occupancies by a building code. Which one of these is the most hazardous occupancy and which is the least hazardous occupancy?

Answer: Most hazardous—Occupancy A-1

Least hazardous—Occupancy A-5

55) Is a university or a college campus building included in "Educational" occupancy? Explain your answer.

Answer: No, a college or university building is not an "Educational" occupancy because an Educational occupancy is for buildings meant for students up to grade 12 only.

56) List the three most important standard writing organizations in the United States, giving their acronyms.

Answer: 1. ASTM International (ASTM)

2. Underwriters Laboratories (UL)

3. American National Standards Institute (ANSI)

57) Is the test procedure to determine the fire resistance or sound insulation of a floor (or a wall) in a building described in a building code or in a construction standard?

Answer: In a construction standard.

58) Is the performance requirement of a floor (or a wall) of a building, such as its required fire resistance rating, covered in a building code or a construction standard?

Answer: Building code.

59) As far as buildings are concerned, what is the Underwriters Laboratories (UL) primarily recognized for?

Answer: Testing the fire resistance of building assemblies.

60) What is the purpose of a zoning ordinance and which organization produces it?

Answer: The purpose of a zoning ordinance is to control the use of land within the jurisdiction of a city. The zoning ordinance is produced by the city.

61) Name the two documents that constitute a zoning ordinance and explain what they contain.

Answer: 1. Zoning map: contains the master plan of the city that divides the land within the city boundaries in zoning districts and sub-districts.  
2. Zoning text: contains: (a) the type(s) of buildings that are allowed in each zoning district and sub-district (b) the development standards (restrictions) related to each lot.

62) How does a zoning ordinance control the building's footprint on a lot?

Answer: By restricting the ground coverage, defined as the area of a building's footprint divided by the area of the lot. This ratio is generally expressed as a percentage.

63) What is FAR?

Answer: FAR stands for floor area ratio. The ratio is the total built-up area in a building (i.e., the sum of areas on various floors of the building) divided by the area of the lot.

64) How does a city handle the request for change in land use prescribed in the city's zoning ordinance?

Answer: Each city has a standing body, called *zoning and planning commission*, that reviews requests for land use change.

65) What does building accessibility mean in practical terms?

Answer: Building accessibility means that (all parts of) a building is (are) as easily accessible to, and useable by, individuals with disability as it is by the normal persons.

66) In terms of a building's accessibility by individuals with disabilities, what types of disabilities are included in the term "disability"?

Answer: Disability with respect to mobility, hearing, seeing, and physical stature.

67) What is the primary purpose of building codes? Explain.

Answer: See the Instructor's Manual (IM).

68) What is the difference between a prescriptive- and a performance-type code provision? Explain with the help of an example.

Answer: See the Instructor's Manual (IM).

69) List the model code organizations that existed in the United States prior to the year 2000 and the building codes published by each.

Answer: See the Instructor's Manual (IM).



70) Describe the relationship between a building code and construction standards, and list three important standards organizations in the United States.

Answer: See the Instructor's Manual (IM).

71) What information can you derive from a given designation of an ASTM standard such as E119-95a?

Answer: See the Instructor's Manual (IM).

72) List the first five steps you will follow in ascertaining that a building conforms to the provisions of the building code.

Answer: See the Instructor's Manual (IM).

73) List at least three codes published by the International Code Council.

Answer: See the Instructor's Manual (IM).

74) What do the terms *ground coverage* and *floor area ratio* (FAR) mean? Are they part of building code provisions? Explain.

Answer: See the Instructor's Manual (IM).

75) What is the board of adjustment? Explain.

Answer: See the Instructor's Manual (IM).

76) What are the responsibilities of a zoning and planning commission of a city?

Answer: See the Instructor's Manual (IM).

Use the figure below to answer the following questions.

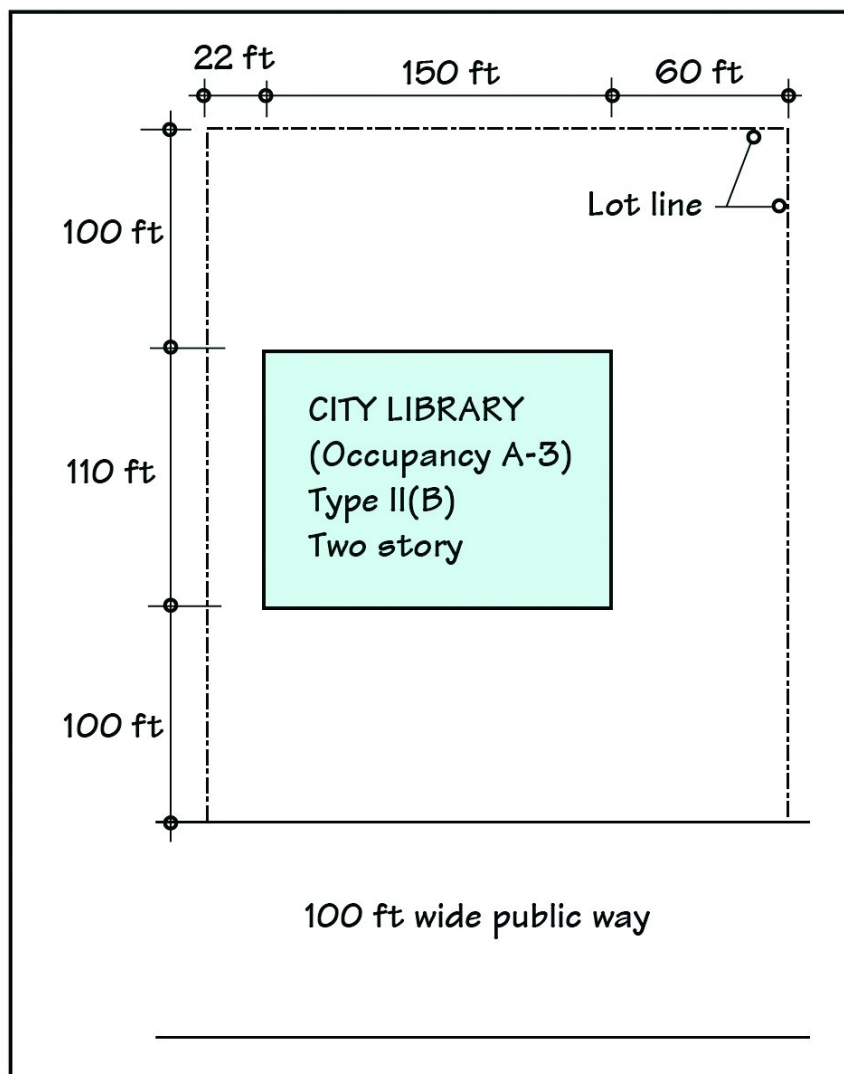


FIGURE 2.27 Layout plan (not to scale) of a library building

77) Show that the value of  $I_f$  for the building of Figure 2.27 is 0.71.

Answer: See the Instructor's Manual (IM).

78) If in the layout plan of Figure 2.27, the rear setback is changed to 35 ft (in place of 100 ft) and all else remains the same as shown, what will be the revised value of  $I_f$ ? Explain.

Answer: See the Instructor's Manual (IM).

79) Show that the value of  $I_f$  in the layout plan of Figure 2.27 is 0.54 if the left-side setback is changed to 15 ft (in place of 22 ft) and all else remains the same as shown.

Answer: See the Instructor's Manual (IM).

80) Show that the maximum allowable area per story of the building of Figure 2.27 is 35,245 sq ft, assuming that the building is fully sprinklered and  $I_f = 0.71$ .

Answer: See the Instructor's Manual (IM).