Practice Problems (Technical and Code)

Theory Quiz

Below are the questions with answers

The correct answer is marked ✔Incorrect answers are marked ✘if you answered incorrectly.

1. Providing a path to the earth often helps reduce electrostatic charge.

   ✔True
   False

2. Ferrous metals contain iron, therefore they cannot be magnetized.

   True
   ✔False

3. The severity of an electric shock is dependent on the current flowing through the body, which is impacted by circuit voltage and contact resistance.

   ✔True
   False

4. Ohmmeters measure the _____ or opposition to current flow of a circuit or component.

   A. voltage
   B. current
   C. power
   D. ✔resistance

5. A holding relay is primarily used for worker convenience.

   ✘True
   ✔False

6. The best conductors, in order of their conductivity, are: gold, silver, copper, and aluminum.

   True
   ✔False

7. What is the power loss in watts of a conductor that carries 24A and has a voltage drop of 7.2V?

A. ✔175W
B. 350W
C. 700W
D. 2,400W

8. What is the conductor power loss in watts for a 120V circuit that has a 3 percent voltage drop and carries a current flow of 12A?

A. ✔43W
B. 86W
C. 172W
D. 1,440W

9. Kirchoff's Voltage Law states that in a series circuit, the sum of the voltage drops across all of the resistors will equal the applied voltage.

✔True
False

10. When power supplies are connected in parallel, the voltage remains the same, but the current or amp-hour capacity will be increased.

✔True
False

11. Improper wiring or mishandling of multiwire branch circuits can cause _____ connected to the circuit.

A. overloading of the ungrounded conductors
B. overloading of the grounded (neutral) conductors
C. destruction of equipment because of overvoltage
D. ✔b and c

12. Metal parts of premises wiring must be bonded to a low-impedance path designed so that the circuit protection device will quickly open and clear a ground fault.

✔True
False

13. Inverse-time breakers operate on the principle that as the current decreases, the time it takes for the device to open decreases.

✗True
✓False

14. Factors that impact the available short-circuit current include transformer _____.

A. voltage
B. kVA rating
C. impedance
D. ✓all of these

15. Equipment must have a(n) _____ current rating that permits the protection device to clear a short circuit or ground fault without extensive damage to the components of the circuit.

A. overload
B. ✓short circuit
C. ground fault
D. ✗b or c

16. Severe electric shock or death can occur if a person touches the ungrounded and the grounded (neutral) conductors at the same time, even if the circuit is GFCI protected.

✓True
✗False

17. An AFCI protection device provides protection from an arcing fault by recognizing the characteristics unique to an arcing fault and by functioning to de-energize the circuit when an arc fault is detected.

✓True
False

18. Even when power is removed from the circuit, capacitors can store large amounts of energy for a long period of time. They can discharge and arc if inadvertently shorted or grounded out.

✓True
False

19. The expanding and collapsing magnetic field within the conductor induces a voltage in the conductors (CEMF) that repels the flowing electrons toward the surface of the conductor. This is called _____.

    A. eddy currents
    B. induced voltage
    C. impedance
    D. ✔skin effect

20. AC inductive or capacitive reactive loads cause the voltage and current to be in-phase with each other.

    True
    ✔False

21. Dual-voltage ac motors are made with two field windings. The field windings are connected in _____ for low-voltage operation and in _____ for high-voltage operation.

    A. series, parallel
    B. ✔parallel, series
    C. series, series
    D. parallel, parallel

22. If the rotating part of the motor winding is jammed so that it cannot rotate, no CEMF will be produced in the motor winding. Result the motor operates at _____ and the windings will be destroyed by excessive heat.

    A. FLA
    B. FLC
    C. ✔LRC
    D. any of these

23. Swapping _____ of the line conductors can reverse a 3Ø ac motor's rotation.

    A. one
    B. ✔two
    C. three
    D. none of these

24. Voltage induced in the secondary winding of a transformer is dependent on the number of secondary turns as compared to the number of primary turns.

✔True
False

25. Three-phase, _____ wye-connected systems can overheat because of circulating odd triplen harmonic currents.

A. 2-wire
B. ✘3-wire
C. ✔4-wire
D. none of these

Understanding NEC, Volume 1

Below are the questions with answers

The correct answer is marked ✔Incorrect answers are marked ✘if you answered incorrectly.

1. When rigid metal conduit is threaded in the field, a standard die with _____ shall be used.

    A. ✔3/4 in. taper per foot
    B. 1 in. taper per foot
    C. 1/16 in. taper per foot
    D. no taper

344.28

2. Nails or screws can fasten boxes to structural members of a building using brackets on the outside of the enclosure, or they can pass through the interior within _____ of the back or ends of the enclosure. Screws are not permitted to pass through the box unless exposed threads in the box are protected using approved means to avoid abrasions of conductor insulation.

    A. 1/8 in.
    B. ✘1/16 in.
    C. ✔1/4 in.
    D. 1/2 in.

314.23(B)(1)

3. IMC shall be firmly fastened within _____ of each outlet box, junction box, device box, fitting, cabinet, or other conduit termination.

    A. ✗12 in.
    B. 18 in.
    C. 2 ft
    D. ✓3 ft

342.30(A)

4. Live parts of electrical equipment operating at _____ or more shall be guarded against accidental contact by approved enclosures or by suitable permanent, substantial partitions, or screens arranged so that only qualified persons have access to the space within reach of the live parts.

    A. 20V
    B. 30V
    C. ✓50V
    D. 100V

110.27(A)(2)

5. Handhole enclosures shall be designed and installed to withstand _____.

    A. 3,000 lb
    B. 6,000 lb
    C. ✓all loads likely to be imposed
    D. ✗600 lb

314.30

6. When ENT is installed concealed in walls, floors, and ceilings of buildings exceeding three floors above grade, a thermal barrier shall be provided having a minimum _____-minute finish rating as listed for fire-rated assemblies.

    A. 5

B. 10

C. ✔15

D. ✘30

362.10(2)

7. When installing raceways underground in rigid nonmetallic conduit and other approved raceways, there shall be a minimum of _____ of cover.

A. 6 in.

B. 12 in.

C. ✔18 in.

D. 22 in.

Table 300.5, Column 3

8. All joints between lengths of ENT, and between ENT and couplings, fittings, and boxes shall be made by _____.

A. a qualified person

B. set screw fittings

C. ✔an approved method

D. exothermic welding

362.48

9. Raceways or cable trays containing electric conductors shall not contain any pipe, tube, or equal for steam, water, air, gas, drainage, or any service other than _____.

A. as allowed by the authority having jurisdiction

B. ✔electrical

C. pneumatic

D. as designed by the engineer

300.8

10. Underground raceways and cable assemblies entering a handhole enclosure shall extend into the enclosure, but they are not required to be _____.

A. bonded

B. ✗insulated

C. ✓mechanically connected to the handhole enclosure

D. below minimum cover requirements after leaving the handhole

314.30(B)

11. The number of conductors allowed in ENT shall not exceed that permitted by the percentage fill specified in _____.

A. ✓Chapter 9, Table 1

B. Table 250.66

C. Table 310.16

D. 240.6

362.22

12. Raceways, cable trays, cable bus, auxiliary gutters, cable armor, boxes, cable sheathing, cabinets, elbows, couplings, fittings, supports, and support hardware shall be of materials suitable for _____.

A. corrosive locations

B. wet locations

C. ✓the environment in which they are to be installed

D. none of these

300.6

13. In the event the NEC requires new products, constructions, or materials that are not yet available at the time a new edition is adopted, the _____ may permit the use of the products, constructions, or materials that comply with the most recent previous edition of this NEC adopted by the jurisdiction.

A. electrical engineer

B. master electrician

C. ✓authority having jurisdiction

D. permit holder

90.4

14. Equipment listed by a qualified electrical testing laboratory is not required to have the factory-installed _____ wiring inspected at the time of installation except to detect alterations or damage.

    A. external
    B. associated
    C. ✔internal
    D. all of these

90.7

15. Type TC cable can be used _____.

    A. for power and lighting circuits
    B. in cable trays in hazardous (classified) locations
    C. in Class 1 control circuits
    D. ✔all of these

336.10

16. For grounded systems, the electrical equipment and wiring, and other electrically conductive material likely to become energized, are installed in a manner that creates a permanent, low-impedance circuit capable of safely carrying the maximum ground-fault current likely to be imposed on it from where a ground fault may occur to the _____.

    A. ✘ground
    B. earth
    C. ✔electrical supply source
    D. none of these

250.4(A)(5)

17. Concrete, brick, or tile walls are considered as _____, as it applies to working space requirements.

    A. inconsequential
    B. in the way
    C. ✔grounded

D. none of these

110.26(A)(1) and Table 110.26(A)(1), Condition 2

18. Electrical systems that are grounded shall be connected to earth in a manner that will _____.

A. limit voltages due to lightning, line surges, or unintentional contact with higher voltage lines
B. stabilize the voltage-to-ground during normal operation
C. facilitate overcurrent protection device operation in case of ground faults
D. ✔a and b

250.4(A)(1)

19. The grounding conductor connection to the grounding electrode shall be made by _____.

A. listed lugs
B. exothermic welding
C. listed pressure connectors
D. ✔any of these

250.70 and 250.8

20. Metallic boxes are required to be _____.

A. metric
B. installed
C. ✔grounded
D. all of these

314.4

21. The wiring contained inside which of the following are required to be accessible?

A. Outlet boxes
B. Junction boxes
C. Pull boxes
D. ✔all of these

314.29

22. When threadless couplings and connectors used in the installation of RMC are buried in masonry or concrete, they shall be of the _____ type.

    A. raintight
    B. wet and damp locations
    C. ✗nonabsorbent
    D. ✓concrete-tight

344.42(A)

23. The following systems shall be installed in accordance with the NEC:

    A. signaling
    B. communications
    C. power and lighting
    D. ✓all of these

90.2(A)

24. EMT shall not be used where _____.

    A. subject to severe physical damage
    B. protected from corrosion only by enamel
    C. used for the support of luminaires
    D. ✓any of these

358.12

25. The grounding electrode conductor is the conductor used to connect the grounding electrode to the equipment grounding conductor and the grounded conductor at _____.

    A. ✗the service
    B. each building or structure supplied by feeder(s)
    C. the source of a separately derived system
    D. ✓all of these

Understanding NEC, Volume 2

Below are the questions with answers

The correct answer is marked ✔Incorrect answers are marked ✘if you answered incorrectly.

1. All threaded conduits or fittings referred to in hazardous (classified) locations shall be threaded with a _____ taper per foot.

   A. ✘½ in.
   B. ✔¾ in.
   C. 1 in.
   D. all of these

500.8(D)

2. A Class III, Division_____ location is where easily ignitible fibers or combustible flying material are stored or handled but not manufactured.

   A. ✘1
   B. ✔2
   C. 3
   D. all of these

500.5(D)(2)

3. Audio system equipment supplied by branch-circuit power shall not be located within _____ of the inside wall of a pool, spa, hot tub, fountain, or tidal high-water mark.

   A. 2 ft
   B. ✘10 ft
   C. ✔5 ft
   D. 18 in.

640.10(A)

4. Conduits, cable trays, and open wiring used for intrinsically safe systems shall be identified by permanently affixed labels with the wording "Intrinsic Safety Wiring." The labels shall be visible after installation and the spacing between labels shall not exceed _____ ft.

    A. 3
    B. ✗10
    C. ✓25
    D. 50

504.80(B)

5. For listed explosionproof equipment, factory threaded entries shall be made up with at least _____ threads fully engaged.

    A. 4
    B. ✓4½
    C. 5
    D. ✗6

500.8(D) Ex

6. No seal is required if a conduit (without unions, couplings, boxes, or fittings) passes completely through a Class I, Division 2 location if the termination points of the unbroken conduit are in unclassified locations and it has no fittings less than _____ beyond each boundary of the classified location.

    A. 6 in.
    B. ✓12 in.
    C. 18 in.
    D. 24 in.

501.15(B)(2) Ex 1

7. Conductors and cables of intrinsically safe circuits not in raceways or cable trays shall be separated by at least _____ and secured from conductors and cables of any nonintrinsically safe circuits.

    A. 6 in.
    B. ✓2 in.
    C. 18 in.

D. 12 in.

504.30(A)(3)

8. In Class I, Division 1 locations, all apparatus and equipment of signaling, alarm, remote-control, and communications systems, _____, shall be identified for Class I, Division 1 locations.

   A. above 50V
   B. above 100 volts-to-ground
   C. ✔regardless of voltage
   D. except under 24V

501.150(A)

9. Intrinsically safe and associated apparatus are permitted to be installed in _____.

   A. ✔any hazardous (classified) location for which they have been identified
   B. ✘Class I locations
   C. Class II locations
   D. Class III locations

504.10(B)

10. In hazardous (classified) locations, intrinsically safe apparatus shall _____ in the hazardous (classified) location in accordance with 250.100.

    A. be secured
    B. ✔be bonded
    C. e painted
    D. ✘not be used

504.60(A)

11. Class II locations are those that are hazardous because of the presence of _____.

    A. ✔combustible dust
    B. easily ignitible fibers or flyings

C. flammable gases or vapors

D. ✗flammable liquids or gases

500.5(C)

12. ITC-HL cables with a gas/vaportight, continuous-corrugated metallic sheath, an overall jacket of suitable polymeric material, and provided with termination fittings listed for the application can be installed in Class I, Division 1 _____ establishments with restricted public access.

A. commercial

B. ✓industrial

C. institutional

D. ✗all of these

501.10(A)(1)(d)

13. Boxes and fittings used for taps, joints, or terminal connections shall be _____ where installed in Class II, Division 1 hazardous (classified) locations.

A. ✗explosionproof

B. ✓identified for Class II locations

C. dusttight

D. weatherproof

502.10(A)(1)(4)

14. Intrinsically safe conduit or cable runs that leave a Class I or II location shall be sealed. The seal shall be _____.

A. explosionproof or flameproof

B. flameproof

C. ✗a and b

D. ✓none of these

504.70

15. Equipment is required to be identified not only for the class of location but also for the explosive, combustible, or ignitible properties of the specific _____ that will be present.

A. gas or vapor
B. dust
C. fiber or flyings
D. ✔all of these

500.8(A)(1)

16. Electrical equipment installed in hazardous (classified) locations shall be constructed for the class, division, and group. An atmosphere containing _____ is classified as Group C.

A. hydrogen
B. ✔ethylene
C. propylene oxide
D. ✘all of these

500.6(A)(3) FPN

17. An assembly of interconnected intrinsically safe apparatus, associated apparatus, and interconnecting cables designed so that those parts of the system used in hazardous (classified) locations are intrinsically safe circuits is a(n) _____.

A. ✔intrinsically safe system
B. safe location
C. reclassified location
D. associated system

504.2

18. Loudspeakers of a permanent audio system which are installed in a fire-resistance rated partition, wall, or ceiling shall be listed for the purpose or installed in an enclosure or recess that _____.

A. ✔maintains the fire-resistance rating
B. ✘is no more than 4 in. deep
C. is no more than 6 ft 6 in. high
D. all of these

640.25

19. All threaded conduits or fittings referred to in hazardous (classified) locations shall be made wrenchtight in order to _____.

    A. prevent sparking when a fault current flows
    B. ensure the explosionproof or flameproof integrity of the conduit system
    C. ✔a and b
    D. none of these

500.8(D)

20. Conductors of intrinsically safe circuits shall not be placed in any _____ with conductors of any nonintrinsically safe system.

    A. raceway
    B. cable tray
    C. cable
    D. ✔any of these

504.30(A)(1)

21. Raceways permitted as a wiring method in Class II, Division 2 hazardous (classified) locations include _____.

    A. ✘rigid metal conduit and intermediate metal conduit
    B. electrical metallic tubing
    C. rigid nonmetallic conduit
    D. ✔a or b

502.10(B)(1)

22. Audio cables installed exposed on the surface of ceilings and walls shall be supported by the structural components of the building in such a manner that the cable will not be damaged by normal building use. Such cables shall be supported by _____ designed and installed so as not to damage the cable.

    A. straps
    B. staples
    C. hangers
    D. ✔any of these

640.6

23. Audio system equipment (speakers) powered by a listed Class 2 power supply, or by the output of an amplifier listed for use with Class 2 wiring, shall only be restricted in its placement by _____.

    A. ✔the manufacturer's recommendations
    B. 640.10(A), within 6 ft of water
    C. ✘the local authority having jurisdiction
    D. the desires of the owner

640.10(B)

24. When seals are required for Class I locations, they shall comply with the following rule(s):

    A. They shall be listed for Class I locations and shall be accessible.
    B. The minimum thickness of the sealing compound shall not be less than the trade size of the sealing fitting and, in no case, less than 5/8 in.
    C. Splices and taps shall not be made in the conduit seal.
    D. ✔all of these

501.15(C)(1), (2), (3), and (4)

25. Raceways permitted as a wiring method in Class II, Division 1 hazardous (classified) locations include _____.

    A. ✔threaded rigid metal conduit and intermediate metal conduit
    B. rigid nonmetallic conduit
    C. electrical metallic tubing
    D. any of these

502.10(A)(1)

Below are the questions with answers

The correct answer is marked ✔Incorrect answers are marked ✘if you answered incorrectly.

1. A(n) _____ is an unintentional, electrically conducting connection between an ungrounded conductor of an electrical circuit and the normally non current-carrying conductors, metallic enclosures, metallic raceways, metallic equipment, or earth.

    A. grounded conductor
    B. ✔ground fault
    C. equipment ground
    D. bonding jumper

250.2

2. For grounded systems, noncurrent-carrying conductive materials enclosing electrical conductors or equipment, or forming part of such equipment, shall be connected to earth so as to limit the voltage-to-ground on these materials.

    ✔True
    False

250.4(A)(2)

3. For ungrounded systems, non current-carrying conductive materials enclosing electrical conductors or equipment, or forming part of such equipment, shall be connected together and to the supply system grounded equipment in a manner that creates a permanent, low-impedance path for ground-fault current that is capable of carrying _____.

    A. the maximum branch circuit current
    B. at least twice the maximum ground fault current
    C. ✔the maximum fault current likely to be imposed on it
    D. the equivalent to the main service rating

250.4(B)(2)

4. Grounding electrode conductor fittings shall be protected from physical damage by being enclosed in _____ where there may be a possibility of physical damage.

    A. metal
    B. ✘wood

C. ✔the equivalent of a or b

D. none of these

250.1

5. Where the service-entrance phase conductors are installed in parallel, the size of the grounded conductor in each raceway shall be based on the size of the ungrounded service-entrance conductor in the raceway, but not smaller than _____.

A. ✔1/0 AWG

B. 2/0 AWG

C. 3/0 AWG

D. 4/0 AWG

250.24(C)(2) and 310.4

6. An unspliced _____ that is sized based on the derived phase conductors shall be used to connect the equipment grounding conductors of a separately derived system to the grounded conductor.

A. ✔system bonding jumper

B. ✘equipment grounding conductor

C. grounded conductor

D. grounding electrode conductor

250.30(A)(1)

7. Each tap conductor to a common grounding electrode conductor for multiple separately derived systems shall be sized in accordance with _____ based on the derived phase conductors of the separately derived system it serves.

A. 250.122

B. ✔250.66

C. ✘310.15

D. 250.118

250.30(A)(4)(b)

8. A grounding electrode at a separate building or structure is required where one multiwire branch circuit serves the building or structure.

   True
   ✔False

250.32(A) Ex

9. High-impedance grounded neutral systems shall be permitted for three-phase ac systems of 480 volts to 1000 volts where the conditions of maintenance and supervision ensure that only qualified persons service the installation and _____.

   A. continuity of power is required
   B. ground detectors are installed on the system
   C. line-to-neutral loads are not served
   D. ✔all of these

250.36

10. An electrode encased by at least 2 in. of concrete, located within and near the bottom of a concrete foundation or footing that is in direct contact with the earth, is allowed as a grounding electrode when it consists of _____.

    A. at least 20 ft of ½ in. or larger steel reinforcing bars or rods
    B. at least 20 ft of bare copper conductor of 4 AWG or larger
    C. ✔a or b
    D. none of these

250.52(A)(3)

11. _____ shall not be used as grounding electrodes.

    A. Metal underground gas piping systems
    B. Aluminum electrodes
    C. Metal well casings
    D. ✔a and b

250.52(B)(1) and (2)

12. Plate electrodes shall be installed not less than _____ below the surface of the earth.

    A. 8 ft
    B. 24 in.
    C. ✔30 in.
    D. 18 in.

250.53(H)

13. When multiple ground rods are used for a grounding electrode, they shall be separated not less than _____ apart.

    A. ✔6 ft
    B. 8 ft
    C. 20 ft
    D. 12 ft

250.56

14. Grounding electrode conductors _____ and larger that are not subject to physical damage can be run exposed along the surface, if securely fastened to the construction.

    A. ✔6 AWG
    B. 8 AWG
    C. 10 AWG
    D. 4 AWG

250.64(B)

15. The connection of the grounding electrode conductor to a buried grounding electrode (driven ground rod) shall be made with a listed terminal device that is accessible.

    ✘True
    ✔False

250.68(A) Ex 1

16. Metal enclosures and raceways for other than service conductors shall be grounded except as permitted by 250.112(I).

✔True
False

250.86

17. Bonding jumpers shall be used around _____ knockouts that are punched or otherwise formed so as to impair the electrical connection to ground. Standard locknuts or bushings shall not be the sole means for this bonding.

    A. concentric
    B. eccentric
    C. field-punched
    D. ✔a or b

250.92(B)

18. Equipment bonding jumpers shall be of copper or other corrosion-resistant material. A bonding jumper shall be a _____ or similar suitable conductor.

    A. conductor
    B. ✘bus
    C. screw
    D. ✔any of these

250.102(A)

19. The general rule for equipment bonding jumpers installed on the outside of a raceway or enclosure is that they are not permitted to be longer than 6 ft, but an equipment bonding jumper can be longer than 6 ft at outside pole locations for the purpose of bonding or grounding isolated sections of metal raceways or elbows installed in exposed risers of metal conduit or other metal raceways.

    ✔True
    False

250.102(E) Ex

20. Metal raceways, enclosures, frames, and other noncurrent-carrying metal parts of electric equipment installed on a building equipped with a lightning protection system may require spacing from the lightning protection conductors, typically 6 ft through air or ___ through

dense materials, such as concrete, brick, wood, etc.

A. 2 ft
B. ✔3 ft
C. 4 ft
D. 6 ft

250.106 FPNs

21. Liquidtight flexible metal conduit (LFMC) up to trade size ½ can be used as the equipment grounding conductor if the length in any ground return path does not exceed 6 ft and the circuit conductors contained in the conduit are protected by overcurrent devices rated at _____ or less when the conduit is not installed for flexibility after installation.

A. 15A
B. ✔20A
C. ✘30A
D. 60A

250.118(6)(b)

22. When ungrounded conductors are increased in size, the equipment grounding conductor is not required to be increased because it is not a current-carrying conductor.

True
✔False

250.122(B)

23. The grounded circuit conductor is permitted to ground noncurrent-carrying metal parts of equipment, raceways, and other enclosures at the supply side or within the enclosure of the ac service disconnecting means.

✔True
False

250.142(A)

24. A grounded circuit conductor shall not be used for grounding noncurrent-carrying metal parts of equipment on the load side of _____.

A. the service disconnecting means

B. the separately derived system disconnecting means

C. overcurrent protection devices for separately derived systems not having a main disconnecting means

D. ✔all of these

250.142(B)

25. The grounding conductor for secondary circuits of instrument transformers and for instrument cases shall not be smaller than _____ AWG copper.

A. 18

B. 16

C. 14

D. ✔12

250.178

Low Voltage and Power Limited Systems (Alarm and Communications)

Below are the questions with answers

The correct answer is marked ✔Incorrect answers are marked ✘if you answered incorrectly.

1. Class 2, Class 3, and PLTC cable not terminated at equipment and not identified for future use with a tag is considered abandoned.

✔True

False

725.2

2. Class 1, 2, and 3 cables installed _____ to framing members shall be protected against physical damage from penetration by screws or nails by 1¼ in. separation from the framing member or by a suitable metal plate in accordance with 300.4(D).

A. ✘exposed

B. concealed
C. ✔parallel
D. all of these

725.8

3. All wiring for Class 1 circuits shall be installed in accordance with Article 300 and the other appropriate articles in Chapter 3.

✔True
False

725.25

4. Conductors of Class 2 and Class 3 circuits shall not be placed in any enclosure, raceway, cable, or similar fittings with conductors of Class 1 or electric light or power conductors, except when they are _____.

A. ✘insulated for the maximum voltage present
B. totally comprised of aluminum conductors
C. ✔separated by a barrier
D. all of these

725.55(B)

5. Class 2 or Class 3 cables, installed in vertical runs penetrating more than one floor or installed in a shaft, shall be type _____.

A. CL2R
B. CL3R
C. CL2P
D. ✔any of these

725.61(B)

6. Type ITC cable is permitted to beinstalled with power, lighting, and Class 1 circuits.

✘True
✔False

727.5

7. All accessible portions of abandoned fire alarm cable shall be removed.

   ✔True
   False

760.3(A)

8. Fire alarm circuits shall be identified at all terminal and junction locations in a manner that will prevent unintentional interference with the signaling circuit during _____.

   A. ✘installation
   B. ✔testing and servicing
   C. renovations
   D. all of these

760.10

9. Nonpower-limited fire alarm circuit conductors of sizes _____ shall be of the types included in 760.27(B) or other types of insulation listed for nonpower-limited fire alarm circuit use. Conductors larger than 16 AWG shall comply with Article 310.

   A. ✔16 and 18 AWG
   B. 14 and 12 AWG
   C. 14 AWG and larger
   D. all of these

760.27(B)

10. The listing requirements for power-limited fire alarm (PLFA) circuit sources are found in Tables 12(A) and 12(B) of _____.

    A. ✘Article 760
    B. ✔Chapter 9
    C. Article 300
    D. Annex C

760.41 FPN No. 1

11. Power-limited fire alarm (PLFA) cables can be supported by strapping, taping, or attaching to the exterior of a conduit or raceway.

✗True
✓False

760.58

12. Conductive optical fiber cables contain noncurrent-carrying conductive members such as metallic _____.

A. strength members
B. vapor barriers
C. ✗armor or sheath
D. ✓any of these

770.9(B)

13. Where exposed to contact with electric light or power conductors, the noncurrent-carrying metallic members of optical fiber cables entering buildings shall be _____.

A. grounded as close to the point of entrance as practicable
B. interrupted as close to the point of entrance as practicable by an insulating joint or equivalent device
C. ✓a or b
D. ✗a and b

770.93

14. Type OFNG, OFN, OFCG, and OFC optical fiber cables may be used as risers when _____.

A. encased in a metal raceway
B. located in a fireproof shaft having a firestop at each floor
C. ✓a or b
D. none of these

770.154(B)(2)

15. All accessible portions of abandoned communications cable shall be removed.

✔True
✘False

800.3(C)

16. The metallic sheath of communications cable entering buildings shall be _____.

A. grounded at the point of emergence through an exterior wall
B. grounded at the point of emergence through a concrete floor slab
C. interrupted as close to the point of entrance as practicable by an insulating joint
D. ✔any of these

800.93

17. Communications conductors and cables shall be separated by at least 2 in. from conductors of _____ circuits.

A. power
B. lighting
C. ✘Class 1
D. ✔any of these

800.133(A)(2)

18. Soft-drawn or medium-drawn copper lead-in conductors for receiving antenna systems are permitted where the maximum span between points of support is less than _____.

A. ✔35 ft
B. ✘30 ft
C. 20 ft
D. 10 ft

810.11 Ex

19. Indoor antenna and lead-in conductors for radio and television receiving equipment shall be separated by at least _____ from conductors of any electric light, power, or Class 1 circuit conductors.

A. 6 ft

B. ✔2 in.

C. 12 in.

D. ✘18 in.

810.18(B)

20. The grounding conductor for an antenna mast or antenna discharge unit shall not be smaller than 10 AWG copper.

✔True
False

810.21(H)

21. The coaxial cable for community antenna television and radio systems is permitted to deliver low-energy power to equipment that is directly associated with the radio frequency distribution system if voltage is not over _____ volts and if the current supply is from a transformer or other energy-limiting device.

A. ✘600

B. 120

C. ✔60

D. 1,000

820.15

22. In one- and two-family dwellings, the grounding conductor for CATV shall be as short as practicable, not to exceed _____ in length.

A. 5 ft

B. 8 ft

C. 10 ft

D. ✔20 ft

820.100(A)(4)

23. Coaxial cable is permitted to be placed in a raceway, compartment, outlet box, or junction box with the conductors of light or power circuits, or Class 1 circuits when _____.

A. ✗installed in rigid metal conduit
B. ✓separated by a permanent barrier
C. insulated
D. none of these

820.133(A)(1)(2) Ex 1

24. Exposed network-powered broadband cables shall be secured to structural components by straps, staples, hangers, or similar fittings designed and installed so as not to damage the cable.

✓True
✗False

830.24

25. Network-powered broadband communications system cables shall be separated at least 2 in. from conductors of _____ circuits.

A. ✗power
B. electric light
C. Class 1
D. ✓any of these

830.133(A)(2)

Estimating Textbook (CALCULATIONS)

Below are the questions with answers

The correct answer is marked ✔Incorrect answers are marked ✘if you answered incorrectly.

1. What is the cross-sectional area in sq in. for 12 RHH (with an outer cover)?

   A. ✘0.0117
   B. ✔0.0353
   C. 0.0252
   D. 0.0327

2. When determining the number of conductors for box fill calculations, which of the following statements is/are true?

   A. A luminaire stud or hickey is considered as one conductor for each type, based on the largest conductor that enters the outlet box.
   B. Internal factory cable clamps are considered as one conductor for one or more cable clamps, based on the largest conductor that enters the outlet box.
   C. The device yoke is considered as two conductors, based on the largest conductor that terminates on the strap (device mounting fitting).
   D. ✔all of these

3. When conductors enter an enclosure opposite a removable cover, the distance from where the conductors enter to the removable cover must not be less than _____.

   A. six times the largest raceway
   B. eight times the largest raceway
   C. ✘a or b
   D. ✔none of these

4. Determine the minimum cubic inches required for two 10 TW conductors passing through a box, four 14 THHN conductors spliced in the box, two 12 TW conductors terminating to a receptacle, and one 12 AWG equipment bonding jumper from the receptacle to the box.

   A. ✘18.5 cu in.
   B. ✔22 cu in.
   C. 20 cu in.

D. 21.75 cu in.

5. If a trade size 3 raceway entry (250 kcmil) is in the wall opposite a removable cover, the distance from that wall to the cover must not be less than _____. Figure 5-37

A. 4 in.
B. ✔4½ in.
C. 5 in.
D. ✘6 in.

6. A raceway contains eight current-carrying conductors. What size conductor is required to feed a 21A noncontinuous lighting load? The overcurrent protection device is rated 30A.

A. 14 THHN
B. 12 THHN
C. ✔10 THHN
D. ✘any of these

7. The ampacity of 10 current-carrying 6 THHW conductors installed in an 18 in. long conduit in a dry location having an ambient temperature of 39°C is _____.

A. ✘47A
B. ✔68A
C. 66A
D. 75A

8. Overload is the condition where current is greater than the equipment ampacity rating, resulting in equipment damage due to dangerous overheating [Article 100]. Overload protection devices, sometimes called heaters, are intended to protect the _____ from dangerous overheating.

A. ✘motor
B. motor control equipment
C. branch-circuit conductors
D. ✔all of these

9. The branch-circuit conductors of a 5 hp, 230V motor with a nameplate rating of 25A must have an ampacity of not less than _____. Note: The motor is used for intermittent duty and, due to the nature of the apparatus it drives, it cannot run for more than five minutes at any one time.

   A. ✗33A
   B. 37A
   C. ✓21A
   D. 23A

10. The motor feeder conductor size for three 15 hp, 208V, three-phase motors; three 3 hp, 208V, single-phase motors; and three 1 hp, 120V, single-phase motors will be _____.

   A. ✗2/0 AWG
   B. 3/0 AWG
   C. ✓4/0 AWG
   D. 250 kcmil

11. The feeder protection for one 25 hp, 208V, three-phase motor, and three 3 hp, 120V, single-phase motors will be _____ after balancing. Note: Use inverse time breakers.

   A. ✓225A
   B. 200A
   C. 300A
   D. 250A

12. _____ equipment such as computers, laser printers, copy machines, etc., can suddenly power down because of reduced voltage, resulting in data losses.

   A. Inductive
   B. ✓Electronic
   C. Resistive
   D. all of these

13. A single-phase, 5 hp motor is located 110 ft from a panelboard. The nameplate indicates that the voltage is 115/230 and the FLA is 52/26A. What size conductor is required if the motor windings are connected in parallel and operate at 115V? Note: Apply the NEC recommended

voltage-drop limits.

A. 10 THHN
B. ✗8 THHN
C. 6 THHN
D. ✓3 THHN

14. An existing junction box is located 65 ft from the panelboard and contains 4 THHN aluminum conductors. What size copper conductor can be used to extend this circuit 85 ft and supply a 50A, 208V load? Note: Apply the NEC recommended voltage-drop limits.

A. ✗8 THHN
B. 6 THHN
C. ✓4 THHN
D. 10 THHN

15. What is the voltage drop of two 4 AWG aluminum conductors that supply a 5 hp, 120V, single-phase motor that has a nameplate rating of 55A? The motor is located 95 ft from the power supply.

A. ✗3.25V
B. ✓5.31V
C. 6.24V
D. 7.26V

16. When sizing the feeder or service, each dwelling unit must have a minimum feeder load of _____ for the two small-appliance branch circuits.

A. ✗1,500 VA
B. 2,000 VA
C. ✓3,000 VA
D. 4,500 VA

17. Household cooking appliances rated 1¾ kW can have the feeder and service loads calculated according to the demand factors of Table 220.55.

✗True

✔False

18. If a service contains 2 AWG conductors, what is the minimum size grounding electrode conductor required?

    A. ✔8 AWG
    B. ✘6 AWG
    C. 4 AWG
    D. 3 AWG

19. The feeder or service neutral load for household cooking appliances, such as electric ranges, wall-mounted ovens, or counter-mounted cooking units, is permitted to be calculated at _____ of the load as determined by 220.55.

    A. ✘50%
    B. 60%
    C. ✔70%
    D. 80%

20. A dwelling unit kitchen has the following appliances: one 9 kW cooktop and one wall-mounted oven rated 5.3 kW. The branch-circuit calculated load for these appliances is _____.

    A. 14.3 kW
    B. 12 kW
    C. ✔8.8 kW
    D. 8 kW

21. A dwelling unit contains one of each of the following: water heater (4 kW), dishwasher (½ hp), dryer, pool pump (¾ hp), cooktop (6 kW), oven (6 kW), A/C (4 hp, 230V), and heat (6 kW). What is the appliance calculated load for the dwelling unit?

    A. ✔6.7 kW
    B. ✘4 kW
    C. 9 kW
    D. 11 kW

22. What is the feeder calculated load for five 10 kW, five 14 kW, and five 16 kW household

ranges?

A. 70 kW
B. 23 kW
C. 14 kW
D. ✔33 kW

23. The minimum feeder calculated load for two 3 kW wall-mounted ovens and one 6 kW cooktop is _____.

A. ✔9.3 kW
B. 11 kW
C. ✘8.4 kW
D. 9.6 kW

24. Using the optional calculations method, determine the calculated load for a 6 kW electric space-heating unit and a 4 kW air-conditioning unit.

A. ✘9,000W
B. 3,900W
C. ✔4,000W
D. 5,000W

25. A dwelling unit has 1,200 sq ft on the first floor, 600 sq ft upstairs (unfinished but adaptable for future use), a 200 sq ft open porch, and the following loads: pool pump (¾ hp), range (13.9 kW), dishwasher (1.2 kW), water heater (4 kW), dryer (4 kW), A/C (5 hp), and electric space heating (6 kW). Using the optional calculation method, what size feeder/service conductor is required for this 120/240V, single-phase service?

A. 100A service with 4 AWG
B. ✔110A service with 3 AWG
C. ✘125A service with 2 AWG
D. 150A service with 1 AWG