Title: **NEC Final** Test: Final

Course: Electrical Applications Unit: Code CLO: 1

Name ANSWER KEY Station 70pts Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Objectives**

1. Student shall identify the correct answers as they relate to the National Electrical Code.

**Assessment**

Students shall demonstrate a comprehension of the objectives listed above by scoring a minimum of 75% on this Test. Grading shall be based on the answer key.

**Instructions**

Select the best answer to each multiple-choice question below.

**Article 90**

1. The Authority Having Jurisdiction (AHJ) for the enforcement of the code are responsible for\_\_\_\_\_\_\_\_\_\_.
   1. making interpretations of the rules
   2. permitting alternative methods to the rules
   3. approving new products
   4. all the above
2. The NEC applies to the installation of \_\_\_\_\_\_\_\_\_.
   1. electrical conductors and equipment within public and private buildings
   2. conductors and equipment that connect to the supply of electricity
   3. optical fiber cables
   4. all the above
3. NEC Chapters 1 through 4 apply \_\_\_\_\_\_\_\_\_.
   1. generally, to all electrical installations
   2. only to special occupancies and conditions
   3. only to special equipment and material
   4. all the above
4. The NEC does not cover installations in \_\_\_\_\_\_\_\_\_\_\_\_.
   1. Recreational Vehicles
   2. Air planes
   3. Floating building
   4. all the above
5. Installations of communications equipment that are under the exclusive control of communications utilities and located outdoors or in building spaces used exclusively for such installations \_\_\_\_\_\_\_\_ covered by the NEC.
   1. are
   2. are sometimes
   3. are not
   4. may be

**Instructions**

Match the Chapter contents to the correct Chapter number.

1. Motors; Generators; Electric heaters
   1. Ch. 2
   2. Ch. 3
   3. Ch. 4
   4. Ch. 5
2. Conductor Properties; Tables
   1. Ch. 9
   2. Ch. 8
   3. Ch. 7
   4. Ch. 6
3. Meter Sockets; PVC Conduit
   1. Ch. 6
   2. Ch. 5
   3. Ch. 4
   4. Ch. 3
4. Grounding; Fuses; Service Calculations
   1. Ch. 2
   2. Ch. 4
   3. Ch. 6
   4. Ch. 8

**Article 100**

1. Locations that are under roofed, open porches and/or interior areas subject to moderate degrees of moisture (like some basements) are \_\_\_\_\_\_ locations.(p32)
2. wet
3. damp
4. moist
5. dry
6. Equipment or material is \_\_\_\_\_\_\_ if it meets appropriate standards or has been tested and found suitable for the purpose and is included in a list published by an organization that is acceptable to the AHJ.(p32)
7. approved
8. identified
9. labeled
10. listed
11. Equipment is \_\_\_\_\_\_\_\_ if it has been described in a particular Code requirement and recognized as being suitable for the specific purpose.(p31)
    1. approved
    2. identified
    3. labeled
    4. listed

Questions 9-12: Match the term with the correct definition below (A, B, C, D, E)

(Found on p30 & 31)

1. Grounding Electrode Conductor\_\_B\_\_
2. Grounded\_\_D\_\_
3. Equipment Grounding Conductor\_\_A\_\_
4. Grounded Conductor\_\_C\_\_
   * 1. conductor used to provide a ground fault current path
     2. conductor used to connect the equipment to a grounding electrode
     3. conductor of a circuit or system that is intentionally grounded
     4. connected to the Earth
5. A solderless pressure connector is a device that \_\_\_\_\_\_\_\_\_ between two or more conductors, or between a terminal and one or more conductors by means of mechanical pressure.(p29)
6. establishes a connection
7. protects the junction
8. is not listed for use
9. provides stability
10. A location that may be temporarily subject to dampness or wetness.(p32)
11. moist
12. wet
13. dry
14. damp

**Article 110**

1. Completed wiring installations shall be free from \_\_\_\_\_\_\_\_\_\_.(Article 110.7)
2. shorts circuits
3. ground faults
4. any connection to ground other than as required or permitted elsewhere
5. “a”, “b” and “c” are correct
6. The NEC requires that electrical work be \_\_\_\_\_ (Article 110.12)
7. installed in a neat and workmanlike manner
8. installed under the supervision of a qualified person
9. Completed before being inspected
10. All Above
11. The connection of conductors to terminal parts shall ensure a thoroughly good connection without damaging the conductors and shall be made by a means of: (Article 110.14B)
12. solder lugs
13. pressure connectors
14. splices to flexible leads
15. any method listed above
16. Wire splices that are soldered, must be mechanically and electrically secure before they are soldered together. (Article 110.14B)
17. True
18. False
19. Only wiring methods recognized as suitable are included in the Code. The recognized methods of wiring shall be permitted to be installed in any type of building or occupancy, except as otherwise provided in the Code. (Article 110.8)
20. True
21. False

**Article 200**

1. The white conductor within a cable can be used for the \_\_\_\_\_\_ conductor where permanently re-identified to indicate its use as an ungrounded conductor at each location where the conductor is visible and accessible. (Article 200.7C)
2. Grounded
3. Ungrounded
4. Grounding
5. All of the above
6. The screw shell of a luminaire or lamp-holder shall be connected to the \_\_\_\_\_\_\_.(Article 200.10C)
7. ground conductor
8. grounded conductor
9. ungrounded conductor
10. luminaire bracket
11. The terminal on a receptacle that is intended for connection to the grounding conductor shall be identified by a metal or metal coating that is substantially white in color. (Article 200.10B1)
12. True
13. False
14. No grounded conductor shall be attached to any terminal so as to reverse the designated polarity. (Article 200.11)
15. True
16. False
17. Where protected from corrosion solely by enamel \_\_\_\_\_\_\_\_\_ shall not be used in wet locations or outdoors.
    1. ferrous metal raceways & cable trays
    2. aluminum boxes & cable sheathing
    3. metal elbows, couplings & nipples
    4. all items in “a”, “b”, and “c”
    5. items listed in “a” and “c” only
18. Cables installed parallel to exposed studs shall be so secured that the nearest outside surface of the cable is not less than \_\_\_\_\_ from the nearest edge of the stud.
19. 1½”
20. 1”
21. 1¼”
22. 0”(it can be “flush”)
23. Where the distances in question #2 (directly above) cannot be maintained, the cable shall be protected from penetration from nails or screws by a steel plate, sleeve or equivalent at least 1.6mm (1/16”) thick.
24. True
25. False

**Article 310**

1. Excluding any other articles, Conductors shall be insulated.
   1. True
   2. False
2. The operating temperature of a conductor shall be allowed to be temporarily exceeded when bundled together with conductors that have a higher operating temperature.
3. True
4. False
5. A \_\_\_\_\_\_\_\_ conductor that carries only the unbalanced current from other conductors of the same circuit \_\_\_\_\_\_\_\_ be required to be counted as current carrying when applying the adjustment factors of 310.15(B)(3)(a)
6. grounding; shall
7. neutral; shall
8. integrated; must
9. neutral; shall not
10. “Generally”, when paralleling conductors, each conductor shall be larger than # 1 AWG.
11. True
12. False

**Article 314**

1. Metal boxes shall be \_\_\_\_\_\_\_\_\_ per Article 250. (2)
   1. grounded
   2. bonded
   3. a and b
   4. none of these
2. Boxes, and conduit bodies, and fittings installed in wet locations shall be listed for wet locations. (3)
3. True
4. False
5. \_\_\_\_\_drainage openings not smaller than 1/8 inch and not larger than ¼ inch in diameter shall be permitted to be installed in the field in boxes conduit bodies listed for in damp or wet locations. (4)
6. Listed
7. Approved
8. Labeled
9. Identified
10. According to the NEC, the volume of a 3x2x2 inch device box is \_\_\_ in2. (6)
11. 8
12. 10
13. 12
14. 14
15. Where one or more internal table clamps are present in the box, a single value allow once in accordance with table 314.16(B) shall be made based on the largest conductor present in the box. (11)
16. True
17. False
18. For the purposes of determining box fill, each device or utilization equipment in the box which is wider that a single device box counts as two conductors for each \_\_\_\_\_ required for the mounting. (13)
19. Inch
20. Kilometer
21. Gang
22. Box

**Article 334**

1. Type NM cable can be installed as open runs in dropped or suspended ceilings in other than one- and two-family and multi-family dwellings. (5)
2. true
3. false
4. Where type NM cable is run at angles with joists in unfinished basements and crawl spaces, it is permissible to secure cables not smaller than \_\_\_\_\_ AWG conductors directly to the lower edges of the joist. (9)
5. Two, 6
6. Three, 8
7. Three, 10
8. a or b
9. Type NM cable shall closely follow the surface of the building finish or running boards when run exposed. (7)
   1. true
   2. false
10. Grommets or bushings for the protection of Type NM cable installed through or parallel to framing members shall be \_\_\_\_\_ for the purpose. (11)
11. Marked
12. Approved
13. Identified
14. listed

**Article 400**

1. Flexible cords and flexible cables can be used for \_\_\_\_. (8)
   1. Wiring of luminaires
   2. Connection of portable luminaires or appliances
   3. Connection of utilization equipment to facilitate frequent interchange
   4. All of these
2. Flexible cord sets and power-supply cords shall not be used as a substitute for \_\_\_ wiring. (10)
3. Temporary
4. Fixed
5. Overhead
6. None of these
7. Flexible cord sets and power-supply cords shall not be concealed behind building \_\_\_\_\_, or run through doorways, windows, or similar openings. (12)
8. Structural ceilings
9. Suspended or dropped ceilings
10. Floors or walls
11. All of these
12. Flexible cord sets and power-supply cords shall not be permitted above suspended or dropped ceilings even if contained within an enclosure for use in “other spaces used for environmental air.” (13)
13. True
14. False

**Article 402**

1. The smallest size fixture wire permitted by the NEC is \_\_\_\_ AWG. (2)
   1. 22
   2. 20
   3. 18
   4. 16
2. Fixture wires are used to connect luminaires to the \_\_\_\_\_ conductors supplying the luminaires. (4)
3. Service
4. Branch-circuit
5. Feeder
6. None of these

**Article 404**

1. When grouping conductor of switch loops in the same raceway, it is not required to include a grounded conductor. (2)
2. True
3. False
4. Switches controlling line-to-neutral lighting loads shall have a grounded conductor provided at the switch location unless the \_\_\_. (5)
5. Conductors enter the device box through a raceway that has sufficient area to accommodate a grounded conductor
6. Box enclosing the switch is accessible for the installation of an additional or replacement cable without removing finish materials
7. Lighting consists of all fluorescent fixtures with integral disconnects for the ballasts
8. a and b
9. Metal faceplates for snap switches, including dimmer and similar control switches, shall be \_\_\_\_. (15)
10. Bonded to the grounded electrode
11. Grounded
12. a and b
13. None of these
14. A snap switch with an integral nonmetallic enclosure complying with 300.15(E) is required to be connected to an equipment grounding conductor. (20)
15. True
16. False
17. Switches shall be marked with the \_\_\_\_. (28)
18. Current
19. Voltage
20. Maximum horsepower, if horsepower rated
21. All of these

**Article 406**

1. Receptacles rated \_\_\_\_ or less and designed for the direct connection of aluminum conductors shall be listed and marked CO/ALR. (3)
2. 15A
3. 20A
4. 25A
5. 30A
6. Receptacles mounted to and supported by a cover shall be secured by more than one screw unless listed and identified for securing by a single screw. (21)
7. True
8. False
9. Grounding-type attachment plugs shall be used only with a cord having a(n) \_\_\_\_ conductor. (39)
10. Equipment grounding
11. Isolated
12. Computer circuit
13. Insulated

**Article 320**

1. Type \_\_\_\_ cable is a fabricated assembly of insulated conductors in a flexible interlocked metallic armor. (1)
   1. AC
   2. MC
   3. NM
   4. B and C
2. Type AC cable installed through, or parallel to, framing members shall be protected against physical damage from penetration by screws or nails. (6)
3. True
4. False
5. Type AC cable shall be secured at intervals not exceeding 4½ ft and within \_\_\_\_ in. of every outlet box. Cabinet, conduit body, or fitting. (11)
6. 6
7. 8
8. 10
9. 12

**Article 330**

1. Type MC cable shall be listed and fittings used for connecting Type MC cable to boxes, cabinets, or other equipment shall \_\_\_\_. (2)
2. Be nonmetallic only
3. Be listed and identified for such use
4. Be listed an identified as weatherproof
5. Include anti-shorting bushings
6. Exposed runs of cable, except as provided in 300.11(A), shall closely follow the surface of the \_\_\_. (4)
7. Building finish
8. Running boards
9. A or B
10. None of these
11. Type MC cable installed through, or parallel to, framing members shall be protected against physical damage from penetration by screws or nails by 1¼ inch separation or protected by a suitable metal plate. (5)
12. True
13. False

**Article 334**

1. Type NM cable can be supported and secured by \_\_\_\_. (12)
2. staples
3. cable ties listed and identified for securement and support
4. straps
5. any of these
6. Grommets or bushings for the protection of Type NM cable installed through or parallel to framing members shall be \_\_\_\_ for the purpose. (11)
7. marked
8. approved
9. identified
10. listed

**Article 358**

1. \_\_\_\_ is an unthreaded thinwall raceway of circular cross section designed for the routing and physical protection of electrical conductors and cables when joined together with listed fittings.
2. LFNC
3. EMT
4. NUCC
5. RTRC
6. EMT shall not be threaded.
7. True
8. False
9. EMT couplings and connectors shall be made up \_\_\_\_.
10. Of metal
11. In accordance with industry standards
12. tight
13. none of these

**Article 362**

1. ENT is composed of a material resistant to moisture and chemical atmospheres and is \_\_.
2. Flexible
3. Flame resistant
4. Fireproof
5. flammable