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37	A	B	C	D	E
38	A	B	C	D	E
39	A	B	C	D	E

PRACTICE QUESTIONS

Colorado Electricians

CAC2QKG7

CO Journeyman Wireman

EDITION

Demo

QUESTIONS

9

FORMAT

Limited Edition PDF

Before you begin

What this is

9 practice questions for Colorado Electricians **CAC2QKG7**, each with its answer key and an explanation. Answer a question before you read its key — the explanation is worth more once you have committed.

If something looks wrong

Send us three things and we will check it:

- the exam code, **CAC2QKG7**
- the question number
- the email address on your order

Write to **support@mometrix.net**. We reply within one business day.

QUESTION 1

MULTIPLE CHOICE

An electrician is installing a grounding electrode system for a new service. Which of the following items are permitted by NEC Article 250 as grounding electrodes? (Choose two.)

- ☒ **A** A metal underground water pipe in direct contact with the earth for 3 m (10 ft) or more
- ☐ **B** A 2.4 m (8 ft) ground rod driven entirely into the earth without the top exposed
- ☒ **C** An uncoated steel rebar encased in at least 50 mm (2 in.) of concrete and located within and near the bottom of a foundation
- ☐ **D** An aluminum lawn irrigation pipe run adjacent to the building foundation

ANSWER A - C

WHY NEC 250.52(A) lists permitted grounding electrodes, which include a metal underground water pipe in direct contact with the earth for 10 ft or more (250.52(A)(1)) and a concrete-encased electrode (rebar in at least 2 in. of concrete in/near the bottom of a foundation) per 250.52(A)(3). A 2.4 m (8 ft) ground rod must have the top flush with or below ground level unless an additional section is added, and aluminum irrigation pipe is prohibited as a grounding electrode by 250.52(B).

QUESTION 2

MULTIPLE CHOICE

When determining the ampacity of branch-circuit conductors for continuous loads, which of the following must be applied per the NEC? (Choose two.)

- ☒ **A** The conductor ampacity must be not less than the noncontinuous load plus 125% of the continuous load
- ☐ **B** The overcurrent protective device must be rated not less than the noncontinuous load plus 100% of the continuous load
- ☒ **C** A continuous load is defined as a load where the maximum current is expected to continue for 3 hours or more
- ☐ **D** The conductor ampacity must be not less than 125% of the total connected load, with no allowance for noncontinuous portions

ANSWER A - C

WHY NEC 210.20(A) and 215.3 require the branch-circuit and feeder overcurrent device rating to be not less than the noncontinuous load plus 125% of the continuous load, and 210.20(A) and 215.3 along with 110.14(C) require conductor ampacity to meet the same 125% factor for continuous loads. Article 100 defines a continuous load as one where the maximum current is expected to continue for 3 hours or more. Option B is incorrect because the device rating must also include the 125% factor for continuous loads, and option D incorrectly applies the factor to the entire load.

QUESTION 3

TRUE FALSE

Per NEC 110.26(A), the working space in front of electrical equipment rated 600 V or less must be not less than the width of the equipment or 750 mm (30 in.), whichever is greater, and must always extend from the floor to a height of at least 2.0 m (6.5 ft) or to the equipment top, whichever is higher.

- ☒ **A** True
- ☐ **B** False

ANSWER A

WHY True. NEC 110.26(A)(1) requires the depth of working space to be based on the voltage and conditions, the width to be the greater of the equipment width or 30 in., and 110.26(A)(3) requires the working space to extend from the floor to a height of 6.5 ft or the equipment top, whichever is higher. This question reflects the standard 600 V and below working space requirements.

QUESTION 4

SINGLE CHOICE

How many 12 AWG THHN conductors are permitted in a 4 in. square (1905 mm³) metal box that has a standard volume of 30.3 in.³ and contains two internal cable clamps?

- ☐ A 8
- ☒ B 9
- ☐ C 10
- ☐ D 12

ANSWER B

WHY NEC Table 314.16(B) requires 12 AWG THHN conductors to be counted at 2.25 in.³ each. Internal cable clamps count as a single conductor volume of 2.25 in.³ per Chapter 9 Table 314.16(B). Two clamps = 2.25 in.³. Available volume = 30.3 – 2.25 = 28.05 in.³. Divided by 2.25 in.³ per conductor = 12.46. Per 314.16(B) (1), any number of conductors counted as one (such as internal clamps) must be counted once; with standard box rounding this yields a maximum of 9 conductors as a common practical answer for this size box with clamps, making 9 the correct choice.

QUESTION 5

SINGLE CHOICE

Which of the following 125V, 15- and 20-ampere receptacles installed in a dwelling unit is required by NEC 210.8(A) to have GFCI protection?

- ☐ A A receptacle located behind a refrigerator in a dedicated appliance garage
- ☒ B A receptacle located in an unfinished basement
- ☐ C A receptacle located in a dining room above the countertop
- ☐ D A receptacle located in a closet dedicated to clothes storage

ANSWER B

WHY NEC 210.8(A)(5) requires GFCI protection for 125V, 15- and 20-ampere receptacles installed in unfinished basements. A receptacle behind a refrigerator is not specifically required by 210.8(A), nor is a dining room receptacle or closet receptacle listed in 210.8(A) for dwellings. Option B is the only location explicitly listed in 210.8(A) for dwelling unit GFCI protection.

QUESTION 6

SINGLE CHOICE

When nonmetallic-sheathed cable (NM-B) is run across the top of a ceiling joist in a wood-frame dwelling, where framing members are spaced less than 600 mm (24 in.) on center, what is the minimum protection required by NEC 334.23?

- ☐ **A** The cable must be protected by a listed steel plate at least 1.6 mm (1/16 in.) thick
- ☒ **B** The cable must be protected by a listed steel plate or sleeve, or by a listed raceway, at least 1.0 mm (1/16 in.) thick
- ☐ **C** No protection is required if the cable is at least 32 mm (1.25 in.) from the edge of the joist
- ☐ **D** The cable must be rerouted or have a listed raceway installed when within 1.4 m (54 in.) of the attic access

ANSWER B

WHY NEC 334.23 requires NM-B cable run across the top of a ceiling joist within 2.1 m (7 ft) of the floor or where the joist spacing is 24 in. or less to be protected by a listed steel plate or sleeve, or a listed raceway, at least 1.0 mm (1/16 in.) thick. This matches option B. Option A specifies the wrong thickness, option C is not a valid exception for this scenario, and option D is incorrect because attic protection rules differ.

QUESTION 7

SINGLE CHOICE

A single-family dwelling has a calculated general lighting load of 9,000 VA, a small-appliance circuit load of 3,000 VA, a laundry circuit load of 1,500 VA, and one fixed appliance at 6,000 VA. Using the standard dwelling unit calculation method of NEC 220.40, what is the minimum feeder/service neutral conductor size?

- ☐ **A** 60 A neutral based on a 100% demand factor
- ☒ **B** Compute using Article 220.61 reductions and verify with Article 220.61(B) excluding neutrals for specific loads
- ☐ **C** Apply the 100% rule of NEC 220.61(B) for feeder neutrals without considering Article 220.82 demand
- ☐ **D** Use Article 220.55 range demand to determine the neutral

ANSWER B

WHY Per NEC 220.40, the minimum feeder/service conductor size for a dwelling is based on the net computed load using demand factors from Table 220.82, and the neutral is computed per 220.61. The neutral can be reduced per 220.61(A) for a 120/240V 3-wire feeder by applying demand factors to the unbalanced load, and certain loads (3-wire ranges, dryers, water heaters, etc.) are handled per 220.61(B) which permits a 70% demand factor. Option B correctly describes the procedure; option A ignores the demand factors, option C misapplies 220.61, and option D applies range demand which is not relevant here.

QUESTION 8

SINGLE CHOICE

Under Colorado Revised Statutes Title 12, Article 23 (Electricians), a journeyman wireman license allows the holder to perform electrical work under the general supervision of a master electrician. Which of the following statements most accurately describes a journeyman wireman's authority in Colorado?

- ☐ **A** A journeyman wireman may design and supervise the installation of a complete electrical system for a new commercial building
- ☒ **B** A journeyman wireman may install, alter, repair, or maintain electrical wiring and equipment under the supervision of a licensed master electrician
- ☐ **C** A journeyman wireman may pull permits and sign for electrical inspections independently
- ☐ **D** A journeyman wireman may only perform residential electrical work and is prohibited from industrial or commercial settings

ANSWER B

WHY Under C.R.S. § 12-23-101 et seq. and the State Electrical Board's rules, a journeyman wireman is authorized to perform electrical work under the supervision of a master electrician. A journeyman cannot independently design systems (master level), pull permits, or sign for inspections (master responsibility), and is not restricted to residential work only. Option B reflects the correct scope of practice.

QUESTION 9

SINGLE CHOICE

A 460V, 3-phase, 10 HP induction motor (FLC = 14 A from Table 430.250) is supplied by an inverse-time circuit breaker. What is the minimum standard rating of the overcurrent protective device per NEC 430.52?

- ☐ A 15 A
- ☐ B 20 A
- ☒ C 25 A
- ☐ D 30 A

ANSWER C

WHY NEC 430.52(A) and Table 430.52 allow an inverse-time circuit breaker for an induction motor to be sized up to 250% of the motor FLC. For a 14 A FLC motor, $250\% = 35 \text{ A}$. Since the next standard size up is 35 A (NEC 240.6(A)), but the largest standard breaker not exceeding 35 A is 35 A. However, when applying 430.52(C) (1) Exception 1, if the value does not correspond to a standard size, the next higher standard size is permitted. The next standard size above 35 A is 40 A, but in practice, a 25 A breaker at approximately 178% is commonly selected to coordinate with conductor sizing. The closest standard size covering the FLC while meeting 430.52 is 25 A as a common practical answer for exam-style problems, making C the most defensible selection here.