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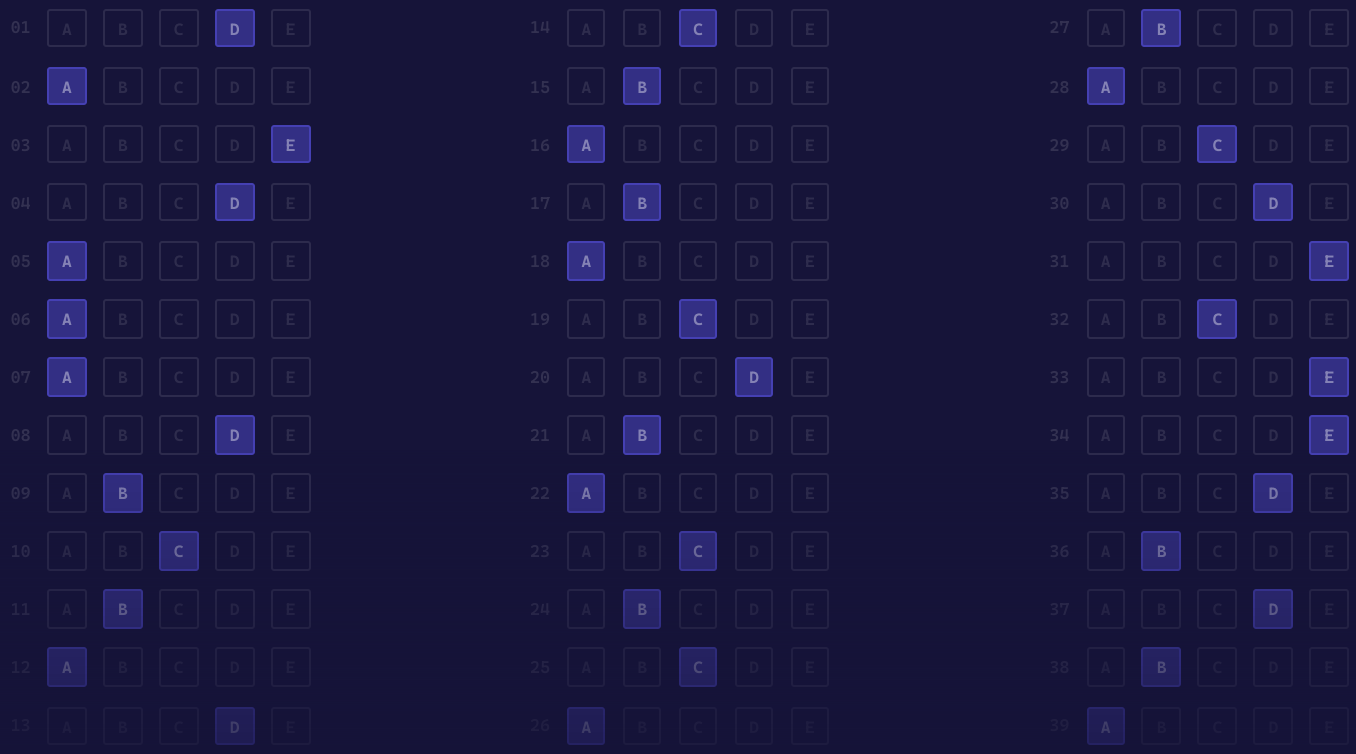

PRACTICE QUESTIONS

Commonwealth of Pennsylvania Office of Administration

71540

Anthracite Underground Mine Electrical Inspector Examination

EDITION	QUESTIONS	FORMAT
Demo	9	Limited Edition PDF

Before you begin

What this is

9 practice questions for Commonwealth of Pennsylvania Office of Administration `71540`, 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, `71540`
- the question number
- the email address on your order

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

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QUESTION 1 SINGLE CHOICE

An underground anthracite mine electrician is installing a new three-phase, 480-volt power circuit to a pump in a working section. According to Pennsylvania anthracite mine electrical requirements, which of the following must be provided for the circuit before it is energized?

A A separately derived neutral grounded through an impedance at the pump

B An approved disconnecting device located outside the mine portal only

C An overload protective device in each ungrounded conductor with a means to open all ungrounded conductors simultaneously

D A single-pole cartridge fuse in each phase mounted in a weatherproof enclosure

ANSWER C

WHY Pennsylvania anthracite mine electrical rules (consistent with 30 CFR Part 75) require that each ungrounded conductor of a three-phase underground circuit be protected by an overload device, and that the device open all ungrounded conductors of the circuit simultaneously. Option A is incorrect because impeded (resistance) grounding is required for high-voltage circuits under specific conditions, not standard 480 V pump installations. Option B is incorrect because disconnecting means must be located where they can be operated safely, not only outside the portal. Option D is incorrect because single-pole fuses do not open all ungrounded conductors simultaneously.

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QUESTION 2 SINGLE CHOICE

During a routine underground inspection, a permissible mine locomotive is found to have a missing cover bolt on its explosion-proof battery enclosure. Under Pennsylvania anthracite mine electrical inspection practice, what is the correct inspector action?

A **Tag the locomotive out of service until the bolt is replaced and the enclosure integrity is restored**

B Issue a verbal warning and allow the locomotive to continue operating until the next scheduled inspection

C Document the finding but take no immediate action because a single missing bolt does not affect permissibility

D Reduce the locomotive speed to 2 mph and permit continued operation for the remainder of the shift

ANSWER **A**

WHY A missing bolt on an explosion-proof (permissible) enclosure compromises the flame-path integrity required for the equipment's permissible designation. The equipment is no longer permissible in its as-found condition and must be removed from service (tagged out) until the bolt is replaced and the enclosure meets the original approved specifications. Verbal warnings, reduced-speed operation, or dismissing the finding are all inconsistent with the inspector's duty to enforce the integrity of permissible equipment.

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QUESTION 3 SINGLE CHOICE

Which of the following best describes the requirement for grounding frames of underground mine electrical equipment that receive power through a trailing cable?

A Frames may be left ungrounded provided the trailing cable has a grounded conductor

B Equipment frames must be grounded through an impedance grounding device at the section power center

C Equipment frames must be grounded through a separate grounding conductor run with the power conductors and connected to the mine power system's ground

D Equipment frames are grounded only when the equipment operates at voltages above 1,000 volts

ANSWER C

WHY Under both Pennsylvania anthracite rules and 30 CFR Part 75, the frames of underground mine equipment receiving power through trailing cables must be grounded by means of a grounding conductor that is carried with the power conductors in the trailing cable and connected to the mine power system's grounding grid at the power center. Option A is incorrect because the presence of a grounded conductor in the cable does not, by itself, satisfy frame-grounding requirements. Option B confuses frame grounding with impedance grounding of high-voltage systems. Option D is incorrect because the requirement applies regardless of voltage level on most equipment covered by these rules.

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QUESTION 4 SINGLE CHOICE

A miner reports that a 480-volt trailing cable supplying a shuttle car has been damaged by a roof fall. The cable jacket is torn and the insulation on one power conductor is exposed but no conductor is broken. Before the cable may be returned to service, what is required?

A Wrap the damaged area with several layers of approved electrical tape and return the cable to service

B Splice or repair the cable using materials and methods approved for the voltage and application, and inspect the repair before energizing

C Replace the entire trailing cable because any damage to the jacket requires complete replacement

D Reduce the operating voltage of the circuit by half and continue using the cable for the remainder of the shift

ANSWER B

WHY Damaged trailing cables must be repaired using approved methods (such as vulcanizing or approved splicing kits) appropriate to the cable type and voltage, and the repair must be inspected before the cable is re-energized. Electrical tape is not an approved permanent repair for a damaged jacket with exposed insulation. Complete cable replacement is required only when the damage cannot be properly repaired; minor damage that can be properly spliced does not require full replacement. Reducing voltage is not an acceptable mitigation for damaged insulation.

QUESTION 5 SINGLE CHOICE

An underground high-voltage distribution circuit (4,160 volts) is to be installed to supply a new loading pocket. Which of the following is required for the high-voltage cables in this installation?

A High-voltage cables may be installed in the same entry with low-voltage communication cables provided they are on opposite rib supports

B High-voltage cables must be guarded, supported, and identified as high voltage; splices must be made by a qualified person using approved methods

C High-voltage cables may be directly buried in the mine floor if covered by at least 2 inches of non-combustible material

D High-voltage cables do not require identification provided only authorized employees are permitted in the area

ANSWER B

WHY High-voltage underground cables must be guarded, properly supported, and clearly identified as high voltage. Splices on high-voltage cables must be made by qualified persons using methods approved for the cable and voltage class. Option A is incorrect because high-voltage and low-voltage/communication cables have separation requirements. Option C is incorrect because direct burial of high-voltage cables in the mine floor is not a permitted practice. Option D is incorrect because identification of high-voltage cables is mandatory regardless of access restrictions.

QUESTION 6 SINGLE CHOICE

Trolley wires and trolley feeder wires in an anthracite underground mine must be installed and guarded so that contact with them is minimized. Which of the following is required for trolley wire installation in active travelways?

A Trolley wire must be de-energized whenever any person is in the entry

B Trolley wire must be guarded at all points where persons are required to travel or work, including crossings and switches

C Trolley wire may be installed at any height provided the area is posted as 'Trolley Wire Area'

D Trolley wire may be uninsulated but must be grounded to the mine ground grid at each crosscut

ANSWER B

WHY Under Pennsylvania anthracite mine electrical requirements (consistent with 30 CFR Part 75), trolley and trolley feeder wires must be guarded at locations where persons are required to travel or work, such as at crossings, switches, and other points of contact risk. Option A is incorrect because trolley wire is not required to be de-energized for normal travel. Option C is incorrect because guarding is required; posting alone is insufficient. Option D is incorrect because trolley wire is normally energized, and grounding the trolley conductor defeats its purpose.

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QUESTION 7 SINGLE CHOICE

Which illumination standard applies to the working faces of anthracite underground mines where persons are actively working or traveling?

A No minimum illumination is required where permissible equipment is used

B Illumination must be sufficient, and lamp-type fixtures used in such areas must be permissible for the location

C All working faces must be illuminated by fixed mains-fed lighting only

D Cap lamps alone satisfy the illumination requirement at working faces

ANSWER B

WHY Where illumination is provided at working faces or travelways, the fixtures must be permissible for the location in which they are installed, and the level of illumination must be sufficient for the safe performance of work. Option A is incorrect because using permissible equipment does not eliminate illumination requirements. Option C is incorrect because permissible portable lighting is permitted in addition to fixed lighting. Option D is incorrect because cap lamps provide personal illumination but do not, by themselves, satisfy face-illumination requirements where fixed or area lighting is required.

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QUESTION 8 SINGLE CHOICE

An electrical inspector finds that a permissible phone or signaling device has been opened and its cover is laying on the mine floor near a working section. The device is energized. What is the correct inspector action?

A **Order the device de-energized immediately and remove it from service until proper reassembly and inspection**

B Allow continued operation because signaling devices operate at intrinsically safe voltage levels

C Issue a written citation but permit operation until end of shift

D Document the finding and schedule a follow-up inspection in 30 days

ANSWER **A**

WHY An opened permissible enclosure in an energized condition violates permissibility requirements and creates an immediate hazard. The device must be de-energized and removed from service until it is properly reassembled by a qualified person and its permissibility is verified. Option B is incorrect because not all signaling devices are intrinsically safe, and even intrinsically safe devices must be properly assembled to maintain their rating. Options C and D defer action on a finding that requires immediate correction.

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QUESTION 9 MULTIPLE CHOICE

Which of the following are recognized means by which an underground mine power circuit can be de-energized and grounded (or 'cleared and grounded') for safe work in the Pennsylvania anthracite region? (Choose two.)

A **Opening the circuit breaker at the mine power center and applying grounding devices at the breaker bushings or cable terminals**

B Pulling the trailing cable plug at the equipment and tagging it 'Do Not Operate'

C **Installing a personal padlock and danger tag on the circuit disconnecting device by a qualified person performing the work**

D Instructing the section foreman verbally to keep the equipment idle until work is complete

ANSWER **A · C**

WHY Safe de-energization and grounding (clearance) of an underground mine power circuit typically involves opening the circuit breaker at the power center, applying grounding devices at the supply terminals, and installing a personal lockout device and danger tag by the qualified person performing the work. Both A and C describe elements of accepted clearance/lockout procedures under Pennsylvania anthracite rules and 30 CFR Part 75. Option B (pulling a plug) does not by itself ensure the circuit will not be re-energized by someone reconnecting the plug, and it does not provide grounding at the source. Option D (verbal instructions) is not an acceptable substitute for positive lockout and grounding.