Mine Electrical Certification

Sample Test Questions

Coal Mine Health and Safety Act Part 77 – (Surface)

1. High voltage power lines must be installed a minimum of:

    a. 30 feet above ground
    b. 100 feet above ground
    c. 15 feet above ground
    d. 50 feet above ground

2. Where high voltage power lines are installed over driveways, haulage ways and railroad tracks they must be installed a minimum of:

    a. 30 feet above ground
    b. 15 feet above ground
    c. 50 feet above ground
    d. 100 feet above ground

3. When operating equipment having a boom or mast, the minimum distance allowed between the boom or mast and a 69,000 to 114,000 volt powerline must be:

    a. 12 feet
    b. 20 feet
    c. 35 feet
    d. 6 feet

4. Ground wires used to ground metallic sheaths, armors, conduits, frames, casing and other metallic enclosures shall be:

    a. Equal in cross sectional area to that of the conductor
    b. Equal to ½ of the cross sectional area of the power conductor if the power conductor is #6 AWG or larger
    c. No smaller than the #6 AWG

5. Circuit breakers for high voltage circuits of surface distribution systems for mobile equipment:

    a. Must provide short circuit and overcurrent protection
    b. Must provide grounded phase protection
    c. Must provide under-voltage protection
    d. All of the above

6. Preparation plants, dryer plants, tipples, draw-off tunnels, shops, and other surface installations shall be equipped with which of the following lists of fire fighting equipment:

a. Two fire extinguishers and 240 lbs. Of rock dust
b. Two portable fire extinguishers, and one additional fire extinguisher for each 10,000 cubic feet volume in the structure
c. One portable fire extinguisher for each room in the building
d. Complete fire sprinkler system

7. When welding, cutting or soldering with arc or flames:

a. One portable fire extinguisher must be provided at the location
b. Precautions shall be taken to make sure that smoldering metal or sparks do not result in a fire
c. In areas likely to contain methane, a methane check must be made
d. All of the above

8. When moving portable substations and transformers:

a. They must be de-energized before they are moved
b. They may be moved while energized if special precautions are taken
c. They must be completely disconnected
d. They may be moved energized since the frames are grounded

9. High voltage circuit breakers and disconnect switches:

a. Must be located close to the equipment they control
b. Must be labeled to show which circuits they control, unless identification can be made readily by location
c. May not be used to protect more than one circuit
d. None of the above

10. Grounding resistors where required in low and medium voltage circuits shall be of an ohmic value to limit the fault current to:

a. 15 amps
b. 50 amps
c. 25 amps
d. 100 amps

11. Power circuits and electric equipment shall be de-energized before work is done on such circuits and equipment, except:

a. When given permission by the Mine Superintendent
b. When troubleshooting or testing
c. When given permission by the Electrical Inspector
d. There is no exception

12. Who may perform electrical work on electric distribution circuits or equipment?

a. By any Journeyman or Master Electrician
b. By a Graduate of an Accredited Electrical School
c. Only by a qualified person by definition of the Act or by a person trained to perform electrical work under the direct supervision of a qualified person
d. A person designated by the Mine operator

13. What is the proper procedure prior to performing work on electric equipment?

a. The power must be removed by turning the circuit breaker off
b. The Foreman must remove the power
c. The power must be removed by means of an approved visible disconnect and locked or tagged out by the person who performs such work
d. The power must be removed by means of an approved visible disconnect and locked or tagged out by any qualified electrician

14. Who may remove locks or tags from electrical equipment?

a. The Mine Superintendent
b. The Electrical Inspector
c. Any qualified electrician
d. Only by the persons who installed them, or if such persons are unavailable, by persons authorized by the operator or his agent

15. What is the frequency of examination of surface electrical equipment?

a. At least daily
b. At least weekly
c. At least monthly
d. At least yearly

16. Which of the following is not a requirement of electric conductors on the surface?

a. Sufficient in size and have adequate current-carrying capacity for the load
b. Constructed such that a rise in temperature resulting from a normal operation will not damage the insulating materials
c. Meet the minimum requirements for ampacity provided in the National Electric Code 1968
d. Possess a MSHA approval number

17. The ampacity of trailing cables for surface equipment shall meet the minimum requirements set forth in:

a. National Electric Code 1968
b. Current National Electric Code
c. Schedule 2G
d. Insulated Power Cable Engineers Association – National Electric Manufacturers Association standards in effect when cables are purchased

18. Cables shall enter metal frames of surface electric equipment only through:

a. Cable glands
b. Proper fittings
c. Junction boxes
d. Pot heads

19. All surface electric equipment and circuits shall be provided with what type of protection:

a. Short circuit and overload
b. Overvoltage and overload
c. Grounded phase and overload
d. Undervoltage and overload

20. Electrical protective devices shall conform to what standards?

a. IPCEA – NEMA
b. National Electric Code 1968
c. IEEE
d. Underwriters Laboratory

21. Where shall lighting arrestors protecting exposed telephone wires entering buildings be located?

a. Within 100 feet of the point where they enter the building
b. At the point where they enter the building
c. At the main terminal block for the telephone system on mine property
d. None of the above

22. Which of the following is not a requirement for the installation of a surface transformer?

a. Transformer shall be of the totally enclosed type, or shall be placed at least 8 feet above the ground, or installed in a transformer house, or surrounded by a
substantial fence at least 6 feet high and at least 3 feet from any energized parts, casings, or wiring
b. Transformer stations shall be enclosed to prevent persons from unintentionally or inadvertently contacting energized parts
c. Transformers shall be housed in fireproof enclosures
d. Transformer enclosures shall be kept locked against unauthorized entry

23. What is the maximum allowable voltage for bare signal or control wires?

a. 24 volts
b. 40 volts
c. 96 volts
d. 100 volts

24. What requirements must be met by all electric wiring and equipment installed after June 30, 1971?

a. Comply with National Electrical Code 1968
b. Comply with National Electrical Code 1971
c. Comply with National Electrical Code in effect at the time of installation
d. Comply with Schedule 2G

25. What is the proper method of grounding metallic sheaths, armors, and conduits in resistance-grounded systems where the enclosed conductors are a part of the system?

a. A solid connection to metal waterlines having low resistance to earth
b. A solid to a grounding conductor, other than the neutral conductor of a resistance-grounded system, extending to a low-resistance ground field
c. A solid connection to the AC neutral ground conductor of the resistance-grounded system
d. None of the above

26. Which of the following is not an approved method of grounding metallic sheaths, armors, and conduits in all systems other than neutral resistance-grounded systems?

a. A solid connection to metal waterlines having low resistance to earth
b. A solid connection to a grounding conductor, other than the neutral conductor of a resistance-grounded system, extending to a low-resistance ground field
c. A solid connection to the AC neutral ground of a resistance-ground system
d. Any other method of grounding approved by an authorized representative of the Secretary

27. Which of the following does not satisfy requirements for the minimum size and capacity of grounding wires?

a. Where the power conductor used is No. 6 AWG or larger, the cross-sectional area of the grounding wire is at least one-half the cross-sectional area of the power conductor
b. Where the power conductor used is less than 6 AWG, the cross-sectional area of the grounding wire is equal to the cross-sectional area of the power conductor
c. A No. 6 AWG ground conductor is adequate in all cases
d. When more than one grounding conductor is used, the sum of the cross-sectional areas of all wires is considered for the total grounding conductor cross-sectional area

28. Low-and-Medium voltage circuits supplying power to portable or mobile three-phase alternating current equipment shall be protected by circuit breakers equipped with devices to provide protection against:

a. Overvoltage, grounded phase, short circuit, and overcurrent
b. Undervoltage, grounded phase, short circuit, and overcurrent
c. Undervoltage, grounded phase, single phase, and short circuit
d. Overvoltage, undervoltage, single phase and grounded phase

29. What is the frequency of examination of circuit breakers protecting low-and-medium voltage circuits serving surface portable or mobile three-phase alternating current equipment?

a. At least daily
b. At least weekly
c. At least monthly
d. At least annually

30. Low-and-Medium voltage circuits supplying power to portable or mobile three-phase alternating equipment shall contain:

a. Either a direct or derived neutral grounded through a suitable resistor at the power source
b. A grounding circuit originating at the grounded side of the grounding resistor which extends along with the power conductor for the frames of all the electric equipment supplied power from the circuit
c. Neither A or B
d. Both A and B

31. Low-and-Medium voltage circuits supplying power to three-phase alternating current stationary electric equipment shall comply with:

a. Schedule 2G
b. IEEE Standards
c. NEMA Standards
d. National Electrical Code

32. Grounding resistors, where required, shall be of ohmic value which limits the ground fault current to a maximum of:

a. 5 amperes
b. 15 amperes
c. 20 amperes
d. 25 amperes

33. Which of the following are grounding resistors not required to comply with?
a. Rated for maximum fault current continuously
b. Rated for a voltage equal to the phase-to-phase voltage of the system
c. Shall meet the “extended time rating” set forth in AIEE Standard No. 32
d. Shall comply with Schedule 2G

34. The maximum voltage used for ground check circuits for low-and-medium voltage alternating current circuits shall not exceed:

a. 24 volts
b. 40 volts
c. 96 volts
d. 100 volts

35. Which of the following is not a requirement of ground check circuits used on surface low-and-medium voltage resistance grounded systems to portable and mobile equipment?

a. Shall be of fail-safe design
b. Shall monitor continuously the grounding circuit to assure continuity
c. Shall cause the circuit breaker to open when either the ground or pilot check wire is broken
d. Shall comply with Schedule 2G

36. How must single-phase loads be connected in resistance grounded systems?

a. Phase-to-phase
b. Phase-to-neutral
c. Phase-to-ground
d. Line-to-ground

37. You are working on a piece of surface electric equipment and you can not locate the fasteners to an electrical panel cover plate. Which of the following procedures should be followed?

a. Leave the cover off and make a note to replace it later
b. Wire the cover in place
c. Remove the machine from service until the cover can be properly installed
d. Notify the equipment operator that the cover is off

38. Energized medium-and high-voltage trailing cables shall be handled:

a. Only by Certified Electricians
b. Only by persons wearing protective rubber gloves
c. Only by the machine helper
d. Only by persons wearing protective leather gloves

39. Rubber protective gloves should be inspected for defects:

a. Once each month
b. Daily
c. Before use on each shift and at least once thereafter during the shift when used for extended periods
d. Once every three months

40. Where must danger signs be installed on the surface?

a. At all major electrical installations
b. Only at substations
c. Only at motor control centers
d. Only at high-voltage electrical installations

41. The frequency of examination and testing of surface electrical equipment shall be:

a. Daily
b. Weekly
c. Monthly
d. Semi-annually

42. The ampacity of trailing cables for surface equipment shall meet the minimum requirements set forth in:

a. Insulated Power Cable Engineers Association; National Electric Manufacturers Association in effect when cables are purchased
b. National Fire Protection Agency
c. Current National Electrical Code
d. National Electric Code 1968

43. Surface electrical equipment and circuits require which of the following types of protection for mobile or portable equipment?

a. Short circuit and overload
b. Over voltage
c. Under voltage and grounded phase
d. All of the above

44. Part 77 applies to:

a. Auger coal mines
b. Surface areas of underground coal mines
c. Surface coal mines
d. All of the above

45. You are going to operate a disconnect switch that has a wooden platform to stand on; however it is raining, what special precautions should you take?

a. None
b. Operate the switch with insulated tongs or other suitable device
c. Don’t operate the switch
d. Have your helper operate the switch

46. Rubber protective gloves should be inspected for defects:

a. Once each month
b. Daily
c. Before use on each shift and at least once thereafter during the shift when used for extended periods
d. Once every three months

47. The grounding resistors shall have a _____ rating.

a. 100 Watt
b. Extended time
c. 500 Watt
d. 15 Minute

48. Low voltage is from 0 to _____ volts.

a. 500
b. 1,000
c. 660
d. 690

49. Circuit breakers and their auxiliary devices shall be tested and examined at least:

a. Daily
b. Monthly
c. Weekly
d. Semi-annually

50. Bare signal or control wires on the surface shall not exceed _____ volts.

a. 30
b. 40
c. 25
d. 50

51. Single-phase loads shall be connected:

a. Phase-to-phase
b. Phase-to-ground
c. Phase-to-neutral
d. Any of the above

52. One of the protections provided by the thermal overload relays in the line starter of an AC circuit is:

a. Short circuit
b. Undervoltage
c. Single-phase
d. Overvoltage

53. The approved method of grounding for metallic sheathes, armors and conduits in resistance grounded systems where the enclosed conductors are a part of the system is to use:

a. A solid connection to the neutral conductor
b. A #8 wire firmly connected to the earth ground rod
c. A #4 wire with permissible coupling to the trolley track
d. Any of the above fulfill the requirements of the Law

54. The maximum elapsed time between training courses for qualified persons is:

a. Annually
b. Semi-annually
c. Every six months
d. Every two years

55. Areas surrounding flammable liquid storage tanks and electric substations and transformers shall be kept free from grass (dry), weeds, underbrush, and other combustible material such as trash, rubbish, leaves and paper for at least:

a. 25 feet
b. 50 feet
c. 100 feet
d. 500 feet

56. Energized medium and high voltage trailing cables shall be handled:

a. Only by Certified Electricians
b. Only by persons wearing protective rubber gloves
c. Only by the machine helper
d. Only by the persons wearing protective leather gloves

57. Normally, all power shall be removed when work is done on circuits or other equipment; what is the exception to this rule?

a. When the breaker is stuck in the ON position
b. When the Foreman says leave it on
c. When troubleshooting
d. There is no exception

58. Heater strips for motor overload relays shall be:

a. 95% to 120% motor full load current
b. 115% to 140% motor full load current
c. 125% to 150% motor full load current
d. 105% to 130%

59. Federal requirements for persons to become qualified to do electrical work for surface requires a minimum experience of:

a. 6 Months
b. 12 Months
c. 18 Months
d. 24 Months

60. Which of the following would be classified as medium voltage?

a. 550V
b. 660V
c. 1,000V
d. 1,250V

61. Who shall maintain a written record of circuit breaker tests and repairs?

a. Person making them
b. Operator
c. Inspector
d. Safety Committee

ANSWER SHEET FOR
MINE LAW 30 CFR, PART 77 (SURFACE)

1. c	22. c	43. d
2. b	23. b	44. d
3. a	24. c	45. b
4. b	25. c	46. c
5. d	26. c	47. b
6. b	27. c	48. c
7. d	28. b	49. b
8. a	29. c	50. b
9. b	30. d	51. a
10. c	31. d	52. c
11. b	32. d	53. a
12. c	33. d	54. a
13. c	34. b	55. a
14. d	35. d	56. b
15. c	36. a	57. c
16. d	37. c	58. b
17. d	38. b	59. b
18. b	39. c	60. c
19. a	40. a	61. b
20. b	41. c	
21. a	42. a	