DIESEL ENGINES AND AFTER-TREATMENT SYSTEMS IN UNDERGROUND BITUMINOUS MINES SECTION 6

PENNSYLVANIA DIESEL LAW

QUESTIONS

**Note: answers must be verbatim with Chapter 4 of the Pennsylvania Safety Laws**

1. Chapter 4 of the Pennsylvania Safety Laws covers the use _____ _____.

    a. of permissible and non-permissible equipment
    b. of diesel powered equipment
    c. of both Heavy duty and light duty equipment
    d. of both inby and outby equipment

2. Chapter 4 of the Pennsylvania Safety Laws covers all the following equipment except:_____
    a. permissible diesel powered equipment,
    b. equipment with horsepower ratings less than 30
    c. non-permissible stationary equipment,
    d. emergency fire-fighting equipment

3. All diesel-powered equipment shall be attended while in operation with the engine running in underground mines. For the purpose of this subsection attended shall mean an equipment operator is _____.
    a. within sight of the equipment
    b. within sight or sound of the equipment
    c. within sound of the equipment
    d. at the controls

4. Diesel-powered equipment must use an engine that is:_____.
    a. approved by MSHA
    b. approved by the Department
    c. certified by MSHA
    d. Both a & c

5. All diesel-powered equipment shall be approved by the department:
    a. with and approved engine_____.
    b. as a complete diesel powered equipment package
    c. with an approved after treatment system
    d. both a & c

6. Exhaust emissions control systems. -- Underground diesel-powered equipment shall include an exhaust emissions:_____.
    a. control and conditioning system
    b. DPM after treatment system
    c. DPM filter
    d. Both b & c

7. Diesel particulate matter emissions cannot exceed an average concentration of_____
    a. 0.12 mg/$m^3$
    b. 1.2 g/$m^3$
    c. 120 *u*/$m^3$
    d 01.2 mg/ $m^3$

8. Exhaust emissions control systems. -- An exhaust emissions control and conditioning system may be approved for multiple diesel engine applications through a single series of laboratory tests, known as:_____.
    a. the MSHA underground engine approval test
    b. test the ISO 8178-1 test
    c. the ISO 8 mode
    d. the EPA engine approval test

9. Components of exhaust emissions system.- Diesel powered equipment must use a diesel particulate matter (DPM) filter that has proven capable of a reduction in total diesel particulate matter to _____ subsection (a)(1).
    a. a seventy five percent level of
    b. a ninety five percent level of
    c. to a level that does not exceed the requirements of
    d. a minimum level required by

10. Components of exhaust emissions system. - All systems must include an oxidation catalyst or other gaseous emissions control device capable of reducing undiluted carbon monoxide emissions to_____ or less
    a. 100 parts per million
    b. 302 parts per million
    c. 50 parts per million
    d. 35 parts per million

11. Components of exhaust emissions system. - All systems must include an engine surface temperature control capable of maintaining significant external surface temperatures below_____.:
    a. 302 degrees Fahrenheit
    b. the ignition temperature of diesel fuel
    c. the ignition temperature of methane
    d 306 degrees Fahrenheit

12. Components of exhaust emissions system - All systems must include an automatic engine shutdown system that will shut off the engine before the exhaust gas temperature reaches: _____.

a. 306 degrees Fahrenheit
b. the ignition temperature of diesel fuel
c. the ignition temperature of methane
d 302 degrees Fahrenheit

13. Components of exhaust emissions system- All systems must include:

a. a spark arrestor
b. a sampling port for measurement of undiluted and untreated exhaust gases
c. a flame arrestor
d. all of the above

14. Onboard engine performance and maintenance diagnostics systems shall be capable of continuously monitoring and giving readouts for:_____.

a. transmission pressure
b. PTO pressure
c. transmissions temperature
d. none of the above

15. Ventilation - The minimum quantities of air in any split where any individual unit of diesel-powered equipment is being operated shall be at least: _____.

a. 6000 cubic feet per minute
b. that specified by the MSHA required ventilation rate
c. that specified on the approval plate for that equipment
d. 9000 cubic feet per minute

16. Ventilation. - Air quantity measurements to determine compliance with this requirement shall: _____.

a. be taken on each air split
b. not include any common air
c. be made at the individual unit
d. not include any neutral air

17. An underground diesel fuel storage facility shall be any facility designed and constructed to provide _____ of any mobile diesel fuel transportation units or the dispensing of diesel fuel.

a. for the temporary storage
b. for the storage
c. for the permanent storage
d. all the above

18. _____of diesel fuel shall be stored in each underground diesel fuel storage facility.

a. No more than 1000 gallons
b. No more than 500 gallons
c. No more than two 250 gallon units
d. No more than one five gallon safety can

19. Underground diesel fuel storage facilities shall be located as follows: _____.

a. at least 50 feet from shafts
b. in an area as that is as dry as practicable
c. at least 25 feet from trolley wires
d. both a & c

20. Underground diesel fuel storage facilities shall meet the following:

a. constructed of noncombustible materials
b. ventilated directly into the return air course
c. equipped with a fire suppression system
d. all of the above

21. Diesel fuel shall not be transferred using:

a. a powered pump requiring more than 12 volts of electrical power
b. compressed gas
c. a nozzle containing a self-closing valve without a latch-open device;
d. a dry pipe fuel distribution system

22. Unburied diesel fuel pipelines shall not exceed _____ and shall have shutoff valves located at each end of the unburied pipeline.

a. 500 feet in length
b. 250 feet in length
c. 300 feet in length
d. 302 feet in length

23. Diesel fuel pipelines _____, except that they may cross the entry perpendicular if buried or otherwise protected from damage and sealed.

a. shall not be located on the same side as trolley wire
b. shall not be located within 25 feet of trolley wire
c shall not be located in any trolley haulage entry
d. shall not be permitted in trolley haulage entries unless the trolley wire has first been de-energized

24. Diesel fuel shall be transported only in:_____.

a. MSHA approved diesel fuel transportation units
b. diesel fuel transportation units approved by the Bureau
c. containers specifically designed for the transport of diesel fuel
d any of the above

25. Containers. - Shutoff valves must be _____ on each connection through which liquid can normally flow.

a. located within one inch of the tank shell
b. located as close as practicable to the tank shell
c. located within one half inch of the tank shell
d. located on the accessible side of the tank shell

26. Containers used for the transport of diesel fuel shall not exceed_____.

a. the capacity set forth is this subsection
b. the capacity of the fire suppressant system located of the mobile unit
c. a capacity of 500 gallons
d. a capacity of 1000 gallons

27. Containers, other than safety cans, used for the transport of diesel fuel _____.

a. shall be permanently fixed to the transportation unit
b. shall be approved by MSHA
c. shall be approved by the Bureau
d shall be approved by the department

28. Diesel fuel transportation units:_____.

a. shall be transported separately and not with any other cars
b. shall be transported individually and not with any other cars
c. not be transported within five minutes of any mantrip
d. shall not be transported by means of trolley locomotives

39. Unattended diesel fuel transportation units:_____.

a. shall be removed from the mine forthwith
b. shall not be allowed in the underground area of the mine
c. shall be parked in a side track designated for diesel fuel storage.
d. shall be parked only in an underground diesel fuel storage facility

30. Safety cans shall be used _____ .

a. by qualified diesel equipment operator
b. for equipment fueling only
c. for emergency fueling only
d. only when necessary

31. Fire suppression for equipment and transportation- The fire suppression system shall provide for automatic engine shutdown. Engine shutdown and discharge of suppressant agent may be delayed for a maximum of _____ after the fire alarm annunciator alerts the operator.

a. a minimum of 10 seconds
b. a maximum of 10 seconds
c. a maximum of 15 seconds
d. a minimum of 15 seconds

32. Fire suppression for equipment and transportation - _____ actuators shall be provided with at least one manual actuator at each end of the equipment. If the equipment is provided with an operator's compartment, one of the mechanical actuators shall be located in the compartment within easy reach of the operator.

a. At least two manual
b. At least three manual
c. No less than three manual
d. A sufficient number of manual

33. Fire suppression for storage areas - Fire suppression systems shall include two manual actuators with _____ _____ the fuel storage facility and at least one located _____ from the storage facility and in intake air.

a. at least one located within, a safe distance away
b. with at least one located adjacent to, fifty feet away
c. with at least one located within, one hundred feet away
d. with at least one located adjacent to, a safe distance away

34. The use of _____ prohibited.

a. starting fluid is
b. all starting aids are
c. chemical starting aids are
d. volatile or chemical starting aids is

35. Fueling of diesel-powered equipment shall not_____ escape-way unless the mine design and entry configuration make it necessary

a. be conducted in the primary intake
b. be conducted in the intake
c. be conducted in any designated intake
d. be conducted in either the primary or secondary intake

36. All used intake air filters, exhaust diesel particulate matter filters and engine oil filters _____ _____ containers and removed from the underground mine to the surface.

a. shall be repacked, in their original containers or other substantial enclosed
b. shall be replaced in their original containers or other suitable enclosed
c. shall be placed, in their original containers or other suitable
d. shall be sealed, in their original containers or other available enclosed

37. Diesel-powered equipment shall be_____ as described in this article or removed from service.

a. maintained in an approved and healthful condition
b. maintained in an approved and safe condition
c. maintained in a safe and healthful condition
d. maintained in a workmen like manner and good operating condition

38. Upon receiving a notice of revocation, the _____ _____ to submit a plan to achieve and maintain compliance.

a. mine superintendent shall have thirty days
b. mine operator shall have sixty days
c. mine superintendent shall have sixty days
d. mine operator shall have thirty days

39. All service, maintenance and repairs of approved complete diesel-powered equipment packages shall be performed by mechanics who are _____.

a. designated by the operator and qualified in accordance Section 422
b. trained and certified in accordance with the requirements of Chapter 4
c. trained and qualified in accordance with Section 422
d. designated by the operator and certified in accordance with Chapter 4

40. Service and maintenance of approved complete diesel-powered equipment packages shall be performed according to:

a. the specified routine maintenance schedule
b .the on-board performance and maintenance diagnostics readings
c. the emissions test results; component manufacturer's recommendations
d. all the above

41. Records -. The person performing the emissions test, examination, maintenance or repair shall certify by _____ that the emissions test, examination, maintenance or repair was made.

a. date, time and initial
b. date, time and engine serial number
c. date, time, engine hour reading and signature
d. date, time, engine hour reading, equipment number and signature

42. Records of preoperational examinations shall be retained for:

a. at least one year and stored at a location outside of the mine
b. the two previous one hundred hour maintenance cycles
c. the two prior one hundred hour maintenance cycles
d. the pervious one hundred hour maintenance cycle

43. Records of emissions tests, one hundred-hour maintenance tests and repairs shall be countersigned once each week by the:_____.

a. certified mine electrician and mine foreman
b. certified mine electrician or mine foreman
c. mine superintendent and mine foreman
d. mine superintendent or mine foreman

44. Preoperational examination- Prior to use of a piece of diesel-powered equipment during a shift, _____ as follows:

a. the trained equipment operator shall conduct an examination
b. any trained diesel powered equipment operator shall conduct an examination
c. an equipment operator shall conduct an examination
d. a qualified equipment operator shall conduct an examination

45. The diesel powered-equipment pre-operational examination requires _____.

a. requires 5 steps prior to engine start-up.
b. requires 10 steps prior to engine start-up.
c. requires 12 steps prior to engine start-up.
d. requires 15 steps prior to engine start-up.

46. Schedule of maintenance- At intervals _____ engine operation, a qualified mechanic shall perform the following maintenance and make all necessary adjustments or repairs or remove the equipment from service:

a. of one hundred hours of underground
b. not exceeding one hundred hours of
c. within two hundred hours of
d. not exceeding one hundred hours of underground

47. When any diesel-powered machine first enters service at a mine, _____ determined by a qualified mechanic.

a. carbon monoxide (CO) emission values shall be
b. baseline emission values shall be
c. all gaseous emission values shall be
b. primary emission values shall be

48. When performing an emissions test the qualified mechanic shall: Allow the engine to operate for a _____, to insure proper carbon monoxide readings and record both carbon monoxide and carbon dioxide readings

a. period time, that is at least 90 seconds duration,
b. sufficient time, not less than 90 seconds duration
c. period of time, of not more than 90 seconds duration
d. sufficient length of time

49. Diagnostic testing -. The qualified mechanic shall do the following: Put the engine into a _____.

a. torque converter stall condition
b. loaded condition
c. full throttle condition
d. high idle condition

50. If the average CO reading for untreated exhaust gas is greater than _____ under section 417-A(b) or if the average CO reading for treated exhaust gas is greater than _____, the equipment has failed and must be serviced and retested before it is returned to regular service;

a. fifty percent of the baseline established, 100 parts per million
b. one hundred percent of the baseline established, 50 parts per million
c. twice the baseline established, 100 parts per millions
d. the baseline established, 50 parts per millions

51. The ambient concentration of exhaust gases in the mine atmosphere shall not exceed_____ for carbon monoxide and _____ for nitrogen dioxide.

a. 35 parts per million, three parts per million
b. 35 parts per million, five parts per million
c. 50 parts per million, three parts per million
d. 50 parts per million, and, five parts per million

52. Ambient exhaust: Measurements shall be made _____ or more often if _____ individual and shall be conducted under the requirements of this section.

a. daily or more often if necessary by a, certified
b. weekly or more often if necessary by a, qualified
c. daily or more often if necessary by a, qualified
d. weekly or more often if necessary by a, certified

53. Measurement of exhaust gases shall be made with a_____ no less precise than detector tubes.

a. hand held gas detecting device
b. portable gas detecting device
c. sampling instrument
d. multi gas detecting device

54. If the concentration of any of the gases listed in subsection (a) _____ _____, changes to the use of the diesel equipment, the mine ventilation or other modifications to the mining process shall be made.

a. is 50 percent or more of its exposure limit
b. is 75percent or more of its exposure limit
c. is 100 percent or more of its exposure limit
d. above the Threshold Limit Value set in this subsection

55. Repair or adjustment of the fuel injection system shall only be performed by qualified mechanics _____.

a. trained by the engine manufacturer
b. authorized by MSHA
c. trained by the Department
d. authorized by the engine manufacturer

56. Approval.--Training course instructors and training plans required by this section shall be approved _____.

a. by the Secretary
b. by the Bureau
c. by the department
d. by the Coal Operator

57. Diesel operator- Refresher training.—Refresher training, separate from that required by MSHA regulations at 30 CFR Pt. 48 (relating to the training and retraining of miners), shall be _____.

a. completed at least once every 12 months
b. required annually
c. required at the discretion of the department
d. completed on a yearly basis

58. Equipment-specific hands-on orientation training shall be given _____ where the equipment will be operated.

a. in an area of the mine
b. in an underground area of the mine
c. safe and secure area
d. any area of the mine

59. Operation of diesel-powered equipment - Roadways where diesel-powered equipment is operated shall be maintained as free as practicable from _____, which affect control of the equipment.

a. bottom irregularities
b. wet and muddy conditions
c. debris
d. all of the above

60. Traffic rules.--Traffic rules, including speed, signals and warning signs, shall be _____ at each mine and posted.

a. standardized
b. governed by the mine foreman
c. governed by the department
d. governed by the mine superintendent

61. Technical Advisory Committee. - The advisory committee shall consist of _____ who shall be residents of this Commonwealth.

a. sufficient number members
b. three members
c. two members
d. a contingent of members

62. Technical advisory committee Terms.—Each member of the technical advisory committee shall be appointed for a term of _____

a. one year
b. two years
c. three years
d. four years

63. Technical advisory committee - _____, the technical advisory committee shall consider requests for the use of alternative diesel-related health and safety technologies with general underground mining industry application which are consistent with this chapter.

a. Upon application of a coal miner, coal mine operator
b. Upon application of a diesel-related technology manufacturer
c. On its own motion
d. all of the above

64. Technical advisory committee –Within _____ of an application for use of alternative technologies or methods, the technical advisory committee shall complete its investigation and make a recommendation to the secretary.

a. 30 days of receipt
b. 60 days of receipt
c. 90 days of receipt
d 180 days of receipt

65. Required certifications or approvals.--Inby and outby diesel-powered equipment may be used in underground mines if the inby or outby diesel-powered equipment uses an engine approved or certified by MSHA, as applicable, for inby or outby use that, when tested at the maximum fuel-air ratio, does not require a MSHA Part 7 approval plate ventilation rate exceeding _____.

a. the ventilating rate set by the department
b. 50 c.f.m..... per rated horsepower
c. 75 c.f.m..... per rated horsepower
d. the guidelines set forth in this subsection.

66. Diesel-powered equipment package. Approval.--All diesel-powered equipment shall be approved by the department as _____ which shall be subject to all of the requirements, standards and procedures set forth under this chapter.

a. a complete diesel powered equipment package
b. a complete unit of diesel powered equipment
c. a complete piece of diesel powered equipment
d. a complete underground diesel powered equipment package

67. Exhaust emissions control -. Except as provided in paragraph (3), the exhaust emissions control and conditioning system shall be required to successfully complete a single series of laboratory tests for each diesel engine, conducted at a _____.

a. laboratory certified by MSHA
b. laboratory certified by the department
c. laboratory approved by the department
d. laboratory accepted by the department

68. Approvals.--Each specific model of diesel-powered equipment shall be approved by the department _____

a. before it is put into service
b. before it is taken underground
c. before it performs any work at the mine
d. before it can be used.

69. Ventilation - Multiple units in operation.--Where multiple units are operated, the minimum quantity shall be at least the total of _____ approval plate ventilation rate for each unit operating in that split.

a.100% of MSHA's Part 7
b.100% of the department's
c. Pennsylvania's
d. the most stringent

70. Ventilation - The department shall require that an approval plate be attached to each piece of the diesel-powered equipment. The approval plate shall specify _____ for the specific piece of diesel-powered equipment.

a. the minimum ventilating air quantity
b. the department's approval plate air quantity
c. the maximum ventilating air quantity
d. the MSHA approval plate air quantity

71. Diesel fuel standards.--Additionally, the fuel shall also meet the ASTM D975 standards with _____ Fahrenheit or greater at standard temperature and pressure.

a. an auto ignition temperature of 650 degrees
b. a flash point of 100 degrees
c. a flash point of 125 degrees
d. an auto ignition temperature of at least 302 degrees

72. Fuel storage facilities - Diesel fuel shall not be allowed to enter pipelines or containers that have been welded, soldered, brazed or cut until the metal has cooled to_____.

a. ambient temperature
b. less than 302 degrees Fahrenheit
c. less than its flash point
d. less than 100 degrees Fahrenheit

73. Fuel storage facilities - Welding or cutting other than that performed in accordance with paragraph (4) shall not be done within _____ of a diesel fuel storage facility.

a. 50 feet
b. 100 feet
c. 150 feet
d. 25 feet

74. Standards for safety cans.—Safety cans shall be clearly marked, _____.

a. have a maximum capacity of five gallons
b. be constructed of metal
c. be equipped with a nozzle and self-closing valves.
d. all of the above

75. Fire suppression for storage areas. - Types of alarms.--Audible and visual alarms to warn of fire or system faults shall be provided _____ always staffed when individuals are underground

a. in the storage facility and other areas of the mine that are
b. outside the storage facility and all areas of the mine that are
c. at the protected area and at a surface location that is
d. to a surface location that is

76. Trained individual on duty.--At least one individual _____ and disposal of diesel fuel spills shall be on duty at the mine when diesel-powered equipment or mobile fuel transportation equipment is being used or when any fueling of diesel-powered equipment is being conducted.

a. certified in the cleanup
b. hazmat trained in the cleanup
c. specially trained in the cleanup
d. who has been qualified in the cleanup

77. Schedule of maintenance. If the equipment is approved with a non-disposable diesel particulate filter, a smoke dot test of the filtered exhaust must be performed at this time. The results of the smoke dot test shall be recorded on the 100-hour emissions form. If the interpreted smoke dot number _____, the technical advisory committee shall be notified and shall investigate to determine if the filter is functioning properly.

a. is greater than two
b is greater than three
c. is greater than four
d. is greater than five

78. Fuel storage facilities- Must be equipped with at least _____multipurpose dry-chemical type fire extinguishers.

a. one portable 20 pound
b. one portable 10 pound
c. two portable 20 pound
d. two portable 10 pound

79. Pump transfers.--When diesel fuel is transferred by means of a pump and a hose equipped with a nozzle containing a self-closing valve, a powered pump may be used only if: the pump _____.

a. is equipped with an accessible emergency shutoff switch
b. is provided with an on-off switch that is within easy reach
c. uses no more than 12 volts of electricity
d .is fully grounded to the electrical system

80. Diesel fuel piping systems - Horizontal pipeline prohibition.--Horizontal pipelines shall not be used _____.

a. to distribute fuel throughout a mine
b. to distribute fuel to more than one fuel storage unit
c. to fuel diesel powered equipment
d. in trolley wire mines

81. Limitations where trolley wires are present.—In mines where trolley wire is used, diesel fuel transportation units shall be provided with insulating material to protect the units from any energized trolley wire, and the distance between the diesel fuel transportation unit and the trolley wire shall _____, or the trolley wire shall be de-energized when diesel fuel transportation units are transported through the area.

a. be at least 24 inches
b. not be less than 12 inches
c. not be less than 15 inches
d. be more than 12 inches

82. Fire suppression devices shall be visually inspected _____ by an individual qualified to make the inspection.

a. at 30 day intervals
b. at least bi-annually
c. at least once each week
d. at 120 day intervals

83. Diesel fuel standards. - The operator shall maintain _____ to verify that the fuel used underground meets this standard.

a. a copy of the most recent delivery receipt from the supplier
b. a copy of a fuel analyses by a laboratory excepted by the department
c. a copy of a fuel analyses by a laboratory approved by the department
d. a copy of a fuel analyses by an independent laboratory

84. Underground diesel fuel storage facilities shall meet all of the following: Be marked with conspicuous signs designating_____.

a. flammable liquid storage
b. combustible liquid storage
c. diesel fuel storage
d. volatile liquid storage

85. Underground diesel fuel storage facilities shall: Be included in _____.

a. the pre-shift examination
b. the on-shift examination
c. the required weekly examination
d. all required underground examinations

DIESEL ENGINES AND AFTER-TREATMENT SYSTEMS IN UNDERGROUND BITUMINOUS MINES SECTION 7

PENNSYLVANIA DIESEL LAW

QUESTION ANSWER KEY

**Note: answers must be verbatim with Chapter 4 of the Pennsylvania Safety Laws**

1. Chapter 4 of the Pennsylvania Safety Laws covers the use _____ _____.

   a. of permissible and non-permissible equipment
   b. of diesel powered equipment
   c. of both Heavy duty and light duty equipment
   **d. of both inby and outby equipment - 401(a)**

2. Chapter 4 of the Pennsylvania Safety Laws covers all the following equipment except:_____

   a. permissible diesel powered equipment,
   b. equipment with horsepower ratings less than 30
   c. non-permissible stationary equipment,
   **d. emergency fire-fighting equipment - 401(a)**

3. All diesel-powered equipment shall be attended while in operation with the engine running in underground mines. For the purpose of this subsection attended shall mean an equipment operator is _____.

   a. within sight of the equipment
   **b. within sight or sound of the equipment - 401(b)**
   c. within sound of the equipment
   d. at the controls

4. Diesel-powered equipment must use an engine that is:_____.

   a. approved by MSHA
   b. approved by the Department
   c. certified by MSHA
   **d. Both a & c - 401(c)**

5. All diesel-powered equipment shall be approved by the department:

   a. with and approved engine_____.
   **b. as a complete diesel powered equipment package- 402(a)**
   c. with an approved after treatment system
   d. both a & c

6. Exhaust emissions control systems. - Underground diesel-powered equipment shall include an exhaust emissions:_____.

**a. control and conditioning system - 403(a)(1)**

b. DPM aftertreatment system

c. DPM filter

d. Both B & C

7. Diesel particulate matter emissions cannot exceed an average concentration of_____.:

**a. 0.12mg/$m^3$ - 403(a)(1)**

b. 1.2 g/$m^3$

c. 120 *u*/$m^3$

d 01.2 mg/ $m^3$

8. Exhaust emissions control systems. -- An exhaust emissions control and conditioning system may be approved for multiple diesel engine applications through a single series of laboratory tests, known as:_____.

a. the MSHA underground engine approval test

b. **test the ISO 8178-1 test - 403(a)(3)**

c. the ISO 8 mode

d. the EPA engine approval test

9. Components of exhaust emissions system.- Diesel powered equipment must use a diesel particulate matter (DPM) filter that has proven capable of a reduction in total diesel particulate matter to _____ subsection (a)(1).

a. a seventy five percent level of

b. a ninety five percent level of

**c. to a level that does not exceed the requirements of - 403(b)(1)**

d. a minimum level required by

10. Components of exhaust emissions system. - All systems must include an oxidation catalyst or other gaseous emissions control device capable of reducing undiluted carbon monoxide emissions to_____ or less

**a. 100 parts per million - 403(b)(2)**

b. 302 parts per million

c. 50 parts per million

d. 35 parts per million

11. Components of exhaust emissions system. - All systems must include an engine surface temperature control capable of maintaining significant external surface temperatures below_____.:

**a. 302 degrees Fahrenheit - 403(b)(3)**

b. the ignition temperature of diesel fuel

c. the ignition temperature of methane

d 306 degrees Fahrenheit

12. Components of exhaust emissions system - All systems must include an automatic engine shutdown system that will shut off the engine before the exhaust gas temperature reaches: _____.

a. 306 degrees Fahrenheit
b. the ignition temperature of diesel fuel
c. the ignition temperature of methane
**d 302 degrees Fahrenheit - 403(b)(4)**

13. Components of exhaust emissions system- All systems must include:

a. a spark arrestor
b. a sampling port for measurement of undiluted and untreated exhaust gases
c. a flame arrestor
**d. all of the above - 403(b) (6)(7)(8)**

14. Onboard engine performance and maintenance diagnostics systems shall be capable of continuously monitoring and giving readouts for:_____.

a. transmission pressure
b. PTO pressure
c. transmissions temperature
**d. none of the above - 403 403(c)**

15. Ventilation - The minimum quantities of air in any split where any individual unit of diesel-powered equipment is being operated shall be at least: _____.

a. 6000 cubic feet per minute
b. that specified by the MSHA required ventilation rate
**c. that specified on the approval plate for that equipment - 404 (c)**
d. 9000 cubic feet per minute

16. Ventilation. - Air quantity measurements to determine compliance with this requirement shall:_____.

a. be taken on each air split
b. not include any common air
**c. be made at the individual unit - 404 (c)**
d. not include any neutral air

17. An underground diesel fuel storage facility shall be any facility designed and constructed to provide _____ of any mobile diesel fuel transportation units or the dispensing of diesel fuel.

a. for the temporary storage
**b. for the storage - 405(a)**
c. for the permanent storage
d. all the above

18. _____of diesel fuel shall be stored in each underground diesel fuel storage facility.

a. No more than 1000 gallons

**b. No more than 500 gallons - 405(c)(2)**

c. No more than two 250 gallon units

d. No more than one five gallon safety can

19. Underground diesel fuel storage facilities shall be located as follows: _____.

a. at least 50 feet from shafts

b. in an area as that is as dry as practicable

c. at least 25 feet from trolley wires

**d. both a & c - 405(d) (2)(3)**

20. Underground diesel fuel storage facilities shall meet the following:

a. constructed of noncombustible materials

b. ventilated directly into the return air course

c. equipped with a fire suppression system

**d. all of the above - 405(e) (2)(i)(ii)**

21. Diesel fuel shall not be transferred using:

a. a powered pump requiring more than 12 volts of electrical power

**b. compressed gas - 406 (c)**

c. a nozzle containing a self-closing valve without a latch-open device;

d. a dry pipe fuel distribution system

22. Unburied diesel fuel pipelines shall not exceed _____ and shall have shutoff valves located at each end of the unburied pipeline.

a. 500 feet in length

b. 250 feet in length

**c. 300 feet in length - 406 (h)**

d. 302 feet in length

23. Diesel fuel pipelines _____, except that they may cross the entry perpendicular if buried or otherwise protected from damage and sealed.

a. shall not be located on the same side as trolley wire

b. shall not be located within 25 feet of trolley wire

**c shall not be located in any trolley haulage entry - 406(n)**

d. shall not be permitted in trolley haulage entries unless the trolley wire has first been de-energized

24. Diesel fuel shall be transported only in:_____.

a. MSHA approved diesel fuel transportation units

b. diesel fuel transportation units approved by the Bureau

**c. containers specifically designed for the transport of diesel fuel - 407 (b)**

d any of the above

25. Containers. - Shutoff valves must be _____ on each connection through which liquid can normally flow.

**a. located within one inch of the tank shell - 407(d)(5)**
b. located as close as practicable to the tank shell
c. located within one half inch of the tank shell
d. located on the accessible side of the tank shell

26. Containers used for the transport of diesel fuel shall not exceed_____.

a. the capacity set forth is this subsection
b. the capacity of the fire suppressant system located of the mobile unit
**c. a capacity of 500 gallons - 407 (f)**
d. a capacity of 1000 gallons

27. Containers, other than safety cans, used for the transport of diesel fuel _____.

**a. shall be permanently fixed to the transportation unit - 407 (g)**
b. shall be approved by MSHA
c. shall be approved by the Bureau
d shall be approved by the department

28. Diesel fuel transportation units:_____.

a. shall be transported separately and not with any other cars
**b. shall be transported individually and not with any other cars - 407(h)**
c. not be transported within five minutes of any mantrip
d. shall not be transported by means of trolley locomotives

29. Unattended diesel fuel transportation units:_____.

a. shall be removed from the mine forthwith
b. shall not be allowed in the underground area of the mine
c. shall be parked in a side track designated for diesel fuel storage.
**d. shall be parked only in an underground diesel fuel storage facility- 407 (m)**

30. Safety cans shall be used _____ .

a. by qualified diesel equipment operator
b. for equipment fueling only
**c. for emergency fueling only - 407 (n)**
d. only when necessary

31. Fire suppression for equipment and transportation- The fire suppression system shall provide for automatic engine shutdown. Engine shutdown and discharge of suppressant agent may be delayed for a maximum of _____ after the fire alarm annunciator alerts the operator.

a. a minimum of 10 seconds
b. a maximum of 10 seconds
**c. a maximum of 15 seconds - 408 (e)**
d. a minimum of 15 seconds

32. Fire suppression for equipment and transportation - _____ actuators shall be provided with at least one manual actuator at each end of the equipment. If the equipment is provided with an operator's compartment, one of the mechanical actuators shall be located in the compartment within easy reach of the operator.

**a. At least two manual - 408(f)**

b. At least three manual

c. No less than three manual

d. A sufficient number of manual

33. Fire suppression for storage areas - Fire suppression systems shall include two manual actuators with _____ _____ the fuel storage facility and at least one located _____ from the storage facility and in intake air.

**a. at least one located within, a safe distance away - 409(e)**

b. with at least one located adjacent to, fifty feet away

c. with at least one located within, one hundred feet away

d. with at least one located adjacent to, a safe distance away

34. The use of _____ prohibited.

a. starting fluid is

b. all starting aids are

c. chemical starting aids are

**d. volatile or chemical starting aids is - 410**

35. Fueling of diesel-powered equipment shall not_____ escape-way unless the mine design and entry configuration make it necessary

a. be conducted in the primary intake

**b. be conducted in the intake- 411(a)**

c. be conducted in any designated intake

d. be conducted in either the primary or secondary intake

36. All used intake air filters, exhaust diesel particulate matter filters and engine oil filters _____ _____ containers and removed from the underground mine to the surface.

a. shall be repacked, in their original containers or other substantial enclosed

**b. shall be replaced in their original containers or other suitable enclosed - 412 (b)**

c. shall be placed, in their original containers or other suitable

d. shall be sealed, in their original containers or other available enclosed

37. Diesel-powered equipment shall be_____ as described in this article or removed from service.

a. maintained in an approved and healthful condition

**b. maintained in an approved and safe condition - 413 (a)**

c. maintained in a safe and healthful condition

d. maintained in a workmen like manner and good operating condition

38. Upon receiving a notice of revocation, the _____ _____ to submit a plan to achieve and maintain compliance.

a. mine superintendent shall have thirty days
b. mine operator shall have sixty days
c. mine superintendent shall have sixty days
**d. mine operator shall have thirty days - 413(a)**

39. All service, maintenance and repairs of approved complete diesel-powered equipment packages shall be performed by mechanics who are _____.

a. designated by the operator and qualified in accordance Section 422
b. trained and certified in accordance with the requirements of Chapter 4
**c. trained and qualified in accordance with Section 422 - 413 (b) (1)**
d. designated by the operator and certified in accordance with Chapter 4

40. Service and maintenance of approved complete diesel-powered equipment packages shall be performed according to:

a. the specified routine maintenance schedule
b .the on-board performance and maintenance diagnostics readings
c. the emissions test results; component manufacturer's recommendations
**d. all the above - 413(b)(2)**

41. Records -. The person performing the emissions test, examination, maintenance or repair shall certify by _____ that the emissions test, examination, maintenance or repair was made.

a. date, time and initial
b. date, time and engine serial number
**c. date, time, engine hour reading and signature - 414(b)**
d. date, time, engine hour reading, equipment number and signature

42. Records of preoperational examinations shall be retained for:

a. at least one year and stored at a location outside of the mine
b. the two previous one hundred hour maintenance cycles
c. the two prior one hundred hour maintenance cycles
**d. the pervious one hundred hour maintenance cycle - 414 (e)**

43. Records of emissions tests, one hundred-hour maintenance tests and repairs shall be countersigned once each week by the:_____.

a. certified mine electrician and mine foreman
**b. certified mine electrician or mine foreman - 414 (f)**
c. mine superintendent and mine foreman
d. mine superintendent or mine foreman

44. Preoperational examination- Prior to use of a piece of diesel-powered equipment during a shift, _____ as follows:

a. the trained equipment operator shall conduct an examination

b. any trained diesel powered equipment operator shall conduct an examination

**c. an equipment operator shall conduct an examination - 415(a)**

d. a qualified equipment operator shall conduct an examination

45. The diesel powered-equipment pre-operational examination requires _____.

a. requires 5 steps prior to engine start-up.

b. requires 10 steps prior to engine start-up.

c. requires 12 steps prior to engine start-up.

**d. requires 15 steps prior to engine start-up. - 415 (a) (2)**

46. Schedule of maintenance- At intervals _____ engine operation, a qualified mechanic shall perform the following maintenance and make all necessary adjustments or repairs or remove the equipment from service:

a. of one hundred hours of underground

**b. not exceeding one hundred hours of - 416**

c. within two hundred hours of

d. not exceeding one hundred hours of underground

47. When any diesel-powered machine first enters service at a mine, _____ determined by a qualified mechanic.

a. carbon monoxide (CO) emission values shall be

**b. baseline emission values shall be - 417(b)**

c. all gaseous emission values shall be

b. primary emission values shall be

48. When performing an emissions test the qualified mechanic shall: Allow the engine to operate for a _____, to insure proper carbon monoxide readings and record both carbon monoxide and carbon dioxide readings

a. period time, that is at least 90 seconds duration,

**b. sufficient time, not less than 90 seconds duration, - 417(b)(13)**

c. period of time, of not more than 90 seconds duration

d. sufficient length of time

49. Diagnostic testing -. The qualified mechanic shall do the following: Put the engine into a _____.

a. torque converter stall condition

**b. loaded condition - 418(a)(10)**

c. full throttle condition

d. high idle condition

50. If the average CO reading for untreated exhaust gas is greater than _____ under section 417-A(b) or if the average CO reading for treated exhaust gas is greater than _____, the equipment has failed and must be serviced and retested before it is returned to regular service;

a. fifty percent of the baseline established, 100 parts per million
b. one hundred percent of the baseline established, 50 parts per million
**c. twice the baseline established, 100 parts per millions - 418(b)(13)**
d. the baseline established, 50 parts per millions

51. The ambient concentration of exhaust gases in the mine atmosphere shall not exceed_____ for carbon monoxide and _____ for nitrogen dioxide.

**a. 35 parts per million, three parts per million - 419(a)**
b. 35 parts per million, five parts per million
c. 50 parts per million, three parts per million
d. 50 parts per million, and, five parts per million

52. Ambient exhaust: Measurements shall be made _____ or more often if _____ individual and shall be conducted under the requirements of this section.

a. daily or more often if necessary by a, certified
**b. weekly or more often if necessary by a, qualified - 419 (a)**
c. daily or more often if necessary by a, qualified
d. weekly or more often if necessary by a, certified

53. Measurement of exhaust gases shall be made with a_____ no less precise than detector tubes.

a. hand held gas detecting device
b. portable gas detecting device
**c. sampling instrument - 419(b)**
d. multi gas detecting device

54. If the concentration of any of the gases listed in subsection (a) _____ _____, changes to the use of the diesel equipment, the mine ventilation or other modifications to the mining process shall be made.

a. is 50 percent or more of its exposure limit
**b. is 75percent or more of its exposure limit - 419(c)**

c. is 100 percent or more of its exposure limit
d. above the Threshold Limit Value set in this subsection

55. Repair or adjustment of the fuel injection system shall only be performed by qualified mechanics _____.

a. trained by the engine manufacturer
b. authorized by MSHA
c. trained by the Department
**d. authorized by the engine manufacturer - 419(e)(1)**

56. Approval.--Training course instructors and training plans required by this section shall be approved _____.

a. by the Secretary
b. by the Bureau
**c. by the department - 420(a)**
d. by the Coal Operator

57. Diesel operator- Refresher training.—Refresher training, separate from that required by MSHA regulations at 30 CFR Pt. 48 (relating to the training and retraining of miners), shall be _____.

a. completed at least once every 12 months
**b. required annually - 420(d)**
c. required at the discretion of the department
d. completed on a yearly basis

58. Equipment-specific hands-on orientation training shall be given _____ where the equipment will be operated.

**a. in an area of the mine - 421(b) (1)**
b. in an underground area of the mine
c. safe and secure area
d. any area of the mine

59. Operation of diesel-powered equipment - Roadways where diesel-powered equipment is operated shall be maintained as free as practicable from _____, which affect control of the equipment.

a. bottom irregularities
b. wet and muddy conditions
c. debris
**d. all of the above - 423(d)**

60. Traffic rules.--Traffic rules, including speed, signals and warning signs, shall be _____ at each mine and posted.

**a. standardized - 423(g)**
b. governed by the mine foreman
c. governed by the department
d. governed by the mine superintendent

61. Technical Advisory Committee. - The advisory committee shall consist of _____ who shall be residents of this Commonwealth.

a. sufficient number members
b. three members
**c. two members - 424 (b)**
d. a contingent of members

62. Technical advisory committee Terms.—Each member of the technical advisory committee shall be appointed for a term of _____

a. one year
b. two years
**c. three years - 424(c)**
d. four years

63. Technical advisory committee - _____, the technical advisory committee shall consider requests for the use of alternative diesel-related health and safety technologies with general underground mining industry application which are consistent with this chapter.

a. Upon application of a coal miner, coal mine operator
b. Upon application of a diesel-related technology manufacturer
c. On its own motion
**d. all of the above - 424(i)(2)**

64. Technical advisory committee –Within _____ of an application for use of alternative technologies or methods, the technical advisory committee shall complete its investigation and make a recommendation to the secretary.

a. 30 days of receipt
b. 60 days of receipt
c. 90 days of receipt
d. 180 days of receipt

65. Required certifications or approvals.--Inby and outby diesel-powered equipment may be used in underground mines if the inby or outby diesel-powered equipment uses an engine approved or certified by MSHA, as applicable, for inby or outby use that, when tested at the maximum fuel-air ratio, does not require a MSHA Part 7 approval plate ventilation rate exceeding _____.

a. the ventilating rate set by the department
b. 50 c.f.m..... per rated horsepower
**c. 75 c.f.m..... per rated horsepower - 401(c)**
d. the guidelines set forth in this subsection.

66. Diesel-powered equipment package. Approval.--All diesel-powered equipment shall be approved by the department as _____ which shall be subject to all of the requirements, standards and procedures set forth under this chapter.

**a. a complete diesel powered equipment package - 402 (a)**
b. a complete unit of diesel powered equipment
c. a complete piece of diesel powered equipment
d. a complete underground diesel powered equipment package

67. Exhaust emissions control -. Except as provided in paragraph (3), the exhaust emissions control and conditioning system shall be required to successfully complete a single series of laboratory tests for each diesel engine, conducted at a _____.

a. laboratory certified by MSHA
b. laboratory certified by the department
c. laboratory approved by the department
**d. laboratory accepted by the department - 403(a)(2)**

68. Approvals.--Each specific model of diesel-powered equipment shall be approved by the department _____

a. before it is put into service
**b. before it is taken underground - 404(b)**
c. before it performs any work at the mine
d. before it can be used.

69. Ventilation - Multiple units in operation.--Where multiple units are operated, the minimum quantity shall be at least the total of _____ approval plate ventilation rate for each unit operating in that split.

**a.100% of MSHA's Part 7 - 404 (d)**
b.100% of the department's
c. Pennsylvania's
d. the most stringent

70. Ventilation - The department shall require that an approval plate be attached to each piece of the diesel-powered equipment. The approval plate shall specify _____ for the specific piece of diesel-powered equipment.

**a. the minimum ventilating air quantity - 404(b)**
b. the department's approval plate air quantity
c. the maximum ventilating air quantity
d. the MSHA approval plate air quantity

71. Diesel fuel standards.--Additionally, the fuel shall also meet the ASTM D975 standards with _____ Fahrenheit or greater at standard temperature and pressure.

a. an auto ignition temperature of 650 degrees
**b. a flash point of 100 degrees - 405(b)**
c. a flash point of 125 degrees
d. an auto ignition temperature of at least 302 degrees

72. Fuel storage facilities - Diesel fuel shall not be allowed to enter pipelines or containers that have been welded, soldered, brazed or cut until the metal has cooled to_____.

**a. ambient temperature - 405(4)(ii)**
b. less than 302 degrees Fahrenheit
c. less than its flash point
d. less than 100 degrees Fahrenheit

73. Fuel storage facilities - Welding or cutting other than that performed in accordance with paragraph (4) shall not be done within _____ of a diesel fuel storage facility.

**a. 50 feet - 405(d)(3)**
b. 100 feet
c. 150 feet
d. 25 feet

74. Standards for safety cans.—Safety cans shall be clearly marked, _____.

a. have a maximum capacity of five gallons
b. be constructed of metal
c. be equipped with a nozzle and self-closing valves.
**d. all of the above - 405(o)**

75. Fire suppression for storage areas. - Types of alarms.--Audible and visual alarms to warn of fire or system faults shall be provided _____ always staffed when individuals are underground

a. in the storage facility and other areas of the mine that are
b. outside the storage facility and all areas of the mine that are
**c. at the protected area and at a surface location that is - 409(d)**
d. to a surface location that is

76. Trained individual on duty.--At least one individual _____ and disposal of diesel fuel spills shall be on duty at the mine when diesel-powered equipment or mobile fuel transportation equipment is being used or when any fueling of diesel-powered equipment is being conducted.

a. certified in the cleanup
b. hazmat trained in the cleanup
**c. specially trained in the cleanup - 411(c)**
d. who has been qualified in the cleanup

77. Schedule of maintenance. If the equipment is approved with a non-disposable diesel particulate filter, a smoke dot test of the filtered exhaust must be performed at this time. The results of the smoke dot test shall be recorded on the 100-hour emissions form. If the interpreted smoke dot number _____, the technical advisory committee shall be notified and shall investigate to determine if the filter is functioning properly.

a. is greater than two
**b. is greater than three - 418(20)**
c. is greater than four
d. is greater than five

78. Fuel storage facilities- Must be equipped with at least _____multipurpose dry-chemical type fire extinguishers.

a. one portable 20 pound
b. one portable 10 pound
**c. two portable 20 pound - 405 (e) 92) (iv)**
d. two portable 10 pound

79. Pump transfers.--When diesel fuel is transferred by means of a pump and a hose equipped with a nozzle containing a self-closing valve, a powered pump may be used only if: the pump _____.

**a. is equipped with an accessible emergency shutoff switch - 405(b)(2)**
b. is provided with an on-off switch that is within easy reach
c. uses no more than 12 volts of electricity
d .is fully grounded to the electrical system

80. Diesel fuel piping systems - Horizontal pipeline prohibition.--Horizontal pipelines shall not be used _____.

**a. to distribute fuel throughout a mine - 406 (i)**
b. to distribute fuel to more than one fuel storage unit
c. to fuel diesel powered equipment
d. in trolley wire mines

81. Limitations where trolley wires are present.—In mines where trolley wire is used, diesel fuel transportation units shall be provided with insulating material to protect the units from any energized trolley wire, and the distance between the diesel fuel transportation unit and the trolley wire shall _____, or the trolley wire shall be de-energized when diesel fuel transportation units are transported through the area.

a. be at least 24 inches
**b. not be less than 12 inches - 407(l)**
c. not be less than 15 inches
d. be more than 12 inches

82 Fire suppression devices shall be visually inspected _____ by an individual qualified to make the inspection.

a. at 30 day intervals
b. at least bi-annually
**c. at least once each week - 409 (h)**
d. at 120 day intervals

83. Diesel fuel standards. - The operator shall maintain _____ to verify that the fuel used underground meets this standard.

**a. a copy of the most recent delivery receipt from the supplier - 405(b)**
b. a copy of a fuel analyses by a laboratory excepted by the department
c. a copy of a fuel analyses by a laboratory approved by the department
d. a copy of a fuel analyses by an independent laboratory

84. Underground diesel fuel storage facilities shall meet all of the following: Be marked with conspicuous signs designating_____.

a. flammable liquid storage

**b. combustible liquid storage - 405 (e) (2) (v)**

c. diesel fuel storage

d. volatile liquid storage

85. Underground diesel fuel storage facilities shall: Be included in _____.

**a. the pre-shift examination - 405 (e) (2) (vi)**

b. the on-shift examination

c. the required weekly examination

d. all required underground examinations