

Certified Person; Maintenance and Calibration – *Continuous Personal
Dust Monitors (CPDM)
Certification Examination Question Pool

* The term “Continuous Personal Dust Monitor” (CPDM) in this examination question pool is in reference to 30 CFR §74.2(d); the use of the term “PDM” is in reference to Thermo Fisher Scientific’s Personal Dust Monitor (Model PDM3700). The Model PDM3700 is currently the only CPDM approved by the Mine Safety and Health Administration (MSHA) and The National Institute for Occupational Safety and Health (NIOSH).

1. The manufacturer's tolerance of error for the PDM flow rate is _____.
 - a. $\pm 10\%$
 - b. $\pm 7.5\%$
 - c. $\pm 5\%$
 - d. $\pm 2.5\%$

2. The K0 number is a(n) _____.
 - a. spring constant
 - b. oscillation correction factor
 - c. calibration constant
 - d. atmospheric density correction factor

3. _____ are the two types of leak checks.
 - a. Cyclone and inlet tubing
 - b. Case and cyclone
 - c. Case and sample path
 - d. Mass transducer and cyclone

4. A case leak check must be performed _____.
 - a. after dropping the PDM
 - b. after reassembly of the case that has been opened
 - c. monthly
 - d. after removing the mass transducer

5. The flow rate of the PDM must be maintained at _____.
 - a. 2.5 lpm
 - b. 2.0 lpm
 - c. 2.2 lpm
 - d. 2.4 lpm

6. The calibrated flow rate of the black orifice (#2) is typically _____.
 - a. 2.0 lpm
 - b. 2.2 lpm
 - c. 1.6 lpm
 - d. 1.8 lpm

7. The calibrated flow rate of the red orifice (#1) is typically _____.
 - a. 2.0 lpm
 - b. 2.2 lpm
 - c. 1.6 lpm
 - d. 1.8 lpm

8. The _____ leak check must be conducted before the case leak check.
- sample path
 - orifice
 - filter
 - none of the above
9. _____ weights are used for the K0 audit.
- Two
 - Three
 - Four
 - Five
10. _____ are required for the flow calibration.
- A flow meter, tubing adapter (if necessary to connect), and inlet plug
 - A flow meter, tubing adapter (if necessary to connect), and colored orifices
 - A flow meter, inlet plug, and colored orifices
 - A flow meter, 7/64-in hex wrench, and tubing adapter (if necessary to connect)
11. A flow audit is require to be conducted _____ or as necessary.
- daily
 - weekly
 - monthly
 - yearly
12. _____ are required for a K0 audit.
- A K0 audit kit, alcohol swab, flat-head screwdriver, and 7/64-inch hex wrench
 - A K0 audit kit, canned air, flat-head screwdriver, 7/64-inch hex wrench, and inlet plug
 - A K0 audit kit, flow meter, 7/64-inch hex wrench, and inlet plug
 - A K0 audit kit, alcohol swab, colored orifices, and 7/64 inch hex wrench
13. The computer software that comes with the PDM is called _____.
- ThermoPDM
 - WinPDM
 - PDMware
 - SetPDM
14. _____ are required to perform the flow audit.
- A flow meter and inlet plug
 - A flow meter and tubing adapter (if necessary to connect)
 - A flow meter and colored orifices
 - A flow meter and tubing clamp

15. _____ are required to conduct the sample path and case leak checks.
- A filter exchange tool and canned air
 - A case leak check suction cup and colored orifices
 - A case leak check suction cup and sample line plug
 - An inlet plug and air flow meter
16. A tilt sensor shall be audited _____ or as necessary.
- daily
 - weekly
 - monthly
 - yearly
17. The pump speed should be adjusted during the flow calibration _____.
- while the red orifice is in
 - while the black orifice is in
 - while either the black or red orifice is in
 - before attaching the orifices
18. The inlet plug should be inserted _____ when conducting a sample path leak check.
- into the sample line
 - into the cyclone plate end of the sample line
 - directly into the cyclone plate
 - into the sample nozzle
19. It is required that the grit pot, sample line, and mass transducer be cleaned _____, after each use or as necessary.
- monthly
 - daily
 - weekly
 - every 6 hours
20. It is required that the sample line is cleaned by _____.
- rinsing with isopropyl alcohol and air drying
 - rinsing with isopropyl alcohol and drying with canned air
 - rinsing with water and air drying
 - flushing with canned air
21. _____ is the maximum percent error of the KO number that is allowed for a KO audit to be successful.
- $\pm 10\%$
 - $\pm 5\%$
 - $\pm 15\%$
 - $\pm 2.5\%$

22. The tools/materials needed for general cleaning of the PDM components are _____.
- water and a cotton swab
 - canned air and an alcohol swab
 - mild detergent and a micro-fiber cloth
 - canned air and mild detergent
23. After opening the case of the PDM for maintenance, a _____ must be performed after reassembly of the case.
- flow audit
 - K0 audit
 - case leak check
 - filter exchange
24. During the K0 Audit, after the final weight is placed, the weights should form a _____.
- square
 - diamond
 - triangle
 - circle
25. During a Case Leak Check, the case leak suction cup should be installed on the _____.
- mass transducer
 - cyclone inlet
 - battery compartment vent
 - bell housing
26. The _____ require(s) occasional lubrication.
- mass transducer O-rings
 - grit pot retaining ring
 - inlet tubing gasket
 - TEOM shaft
27. WinPDM will run on _____ operating system(s).
- Mac OS
 - Linux
 - Windows
 - all of the above
28. _____ is needed when lubricating the Mass Transducer O-rings.
- Silicone compound
 - Liquid soap
 - Graphite lubricant
 - Low-viscosity hydrocarbon lubricant

29. When cleaning the mass transducer, canned air must only be directed at the bell-shaped inlet because the _____ sensor could become damaged.
- flow rate
 - ambient temperature
 - filter loading pressure
 - ambient pressure
30. Before changing out the filter with the Filter Exchange Tool, the tool should be cleaned with _____.
- canned air
 - a soft cloth
 - either a or b
 - isopropyl alcohol
31. The first step when opening the PDM case is to _____.
- remove the security screws from the top and front of the PDM
 - ensure the PDM is plugged in and charging
 - detach the sample line and cap lamp from the unit
 - remove the mass transducer
32. In the event that you receive the “DIAGNOSTIC FAILURE” message at the end of the PDM’s warm-up period, to accurately diagnose the issue you will need to _____.
- perform a K0 audit
 - run the Instrument Diagnostics using WinPDM
 - verify that all cords are correctly attached and that the mass transducer is installed
 - verify that the TEOM filter is correctly installed
33. When replacing the TEOM filter with the filter exchange tool, it is important to _____.
- not touch the filter with your fingers
 - apply pressure to the filter with the back of the filter exchange tool.
 - make use of the filter change notch to prevent damaging the TE post
 - all of the above
34. _____ is a position tested in the Tilt Audit.
- Display facing up
 - Upside down
 - Connector facing up
 - None of the above
35. _____ is the function of the mass transducer.
- Preventing over accumulation of mass on the filter
 - Measuring the dust deposited on the filter
 - Holding the filter in place
 - Preheating the air sample

36. The total filter loading that is regulated by the flow control system is _____ inches of Mercury (Hg).
- various
 - 5
 - 6
 - 7
37. As indicated on the front of the PDM charger, the PDM light on the charger is _____ when the PDM is “charging.”
- solid red
 - solid green
 - flashing green
 - flashing red
38. As indicated on the front of the PDM charger, the PDM light on the charger is _____ when the PDM has a “charge greater than 80%.”
- solid red
 - solid green
 - flashing green
 - flashing red
39. As indicated on the front of the PDM charger, the PDM light on the charger is _____ when there is an error with the PDM.
- solid red
 - solid green
 - flashing green
 - flashing red
40. TEOM stands for _____.
- Thermo External Oscillating Microbalance
 - Tapered Eternal Oscillating Microbalance
 - Thermo Element Oscillating Microbalance
 - Tapered Element Oscillating Microbalance
41. The pump speed should be adjusted _____.
- during the Flow Audit
 - during the Flow Calibration
 - during the Case Leak Check
 - during the Sample Path Leak Check
42. The level of charge/status of the PDM battery is indicated by _____.
- an LED light located on the front of the charging unit
 - the internal clock in the unit
 - the sound of the charger
 - the battery graphic display screen

43. To maintain certification in maintenance and calibration for the CPDM, the certified person must pass an MSHA examination every ____ year(s).
- two
 - three
 - five
 - four
44. A blinking S located in the upper right corner of the PDM's top panel display indicates _____.
- an error has voided the sample
 - a status condition has been logged during the sample run
 - the PDM is broken
 - a nearby electromagnetic field
45. CPDMs must be checked by a certified person in sampling using the CPDM or in maintenance and calibration for the CPDM within ____ hours before the start of the shift on which the device will be used to collect respirable dust samples.
- 2
 - 3
 - 4
 - 5
46. Procedures to assure the operational readiness of a CPDM as recommended by the manufacturer may be performed by _____.
- a certified person in sampling using the CPDM
 - a certified person in maintenance and calibration for the CPDM
 - both a and b
 - the person who will be wearing the CPDM
47. _____ can perform sampling with a CPDM.
- Safety personnel
 - A person certified in sampling using the CPDM
 - Both a and b
 - None of the above
48. _____ can perform maintenance and calibration on a CPDM.
- Safety personnel
 - A person certified in sampling using the CPDM
 - A person certified in Maintenance and calibration for the CPDM
 - Both a and b

49. Maintaining the CPDM according to _____ recommendations will ensure that it is maintained as approved under 30 C.F.R. Part 74.
- MSHA's
 - NIOSH's
 - the manufacturer's
 - the District Manager's
50. _____ must be satisfactorily completed to become certified in maintenance and calibration for the CPDM.
- The MSHA maintenance and calibration course of instruction
 - The MSHA maintenance and calibration exam
 - The manufacturer's PDM operation course
 - both a. and b.
51. The PDM _____ has a separate serial number.
- pump
 - battery
 - mass transducer
 - case
52. _____ is permitted to perform the daily or after each use cleaning requirements for the PDM.
- A certified person in maintenance and calibration for the – CPDM
 - Any mine official
 - A certified person in sampling using the – CPDM
 - Both a. and c.
53. Cleaning the sample lines as specified by the manufacturer includes cleaning of the sample inlet and is required to be done _____ or after each use.
- annually
 - daily
 - monthly
 - none of the above
54. The grit pot is to be cleaned daily or after each use with _____.
- canned air
 - water
 - an alcohol swab
 - both a. and c.
55. The cyclone and inlet tubing is required to be cleaned _____ or as necessary.
- monthly
 - daily
 - weekly
 - every 6 months

56. When the cyclone is removed for cleaning and reinstalled, a _____ check must be performed.
- a. case leak
 - b. PDM leak
 - c. sample path leak
 - d. all of the above