**Tech Problem**

The Field of Dreams Mine is a 3 entry development. Air enters the mine through the #1 entry and exits the mine through the #2 and #3 entries. You are standing in the #2 entry. You will need to determine the airflow in the #2 entry using a vane anemometer and using a smoke tube. Take a reading from the test port in the permanent stopping with man door between the #1 and #2 entries using the magnehelic gauge.

Field Set-Up

![A picture containing shoji

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**Field Set-Up Notes**

Use 10 feet widths on the field. The pipe used for height can be anything measurable. I am providing the heights and widths for each exercise (anemometer and smoke tube). They will be different.

**Anemometer**

Width 19 feet

Height 9 feet

Anemometer Reading – “See Anemometer Picture”

Anemometer Reading is 1222 ft/min

Correction Factor is -35

Corrected Anemometer Reading is 1187 ft/min

Area is 171 ft2

Airflow is 1187 ft X 171 ft2 = 202,977 CFM

**Smoke Tube**

Width 18 feet

Height 7 feet

Smoke Tube – measure off 10 feet

Quadrant 1 time is 12 seconds

Quadrant 2 time is 13 seconds

Quadrant 3 time is 15 seconds

Quadrant 4 time is 10 seconds

Avg Time = 12.5 sec

Velocity = 10 ft/12.5 sec = 0.8 ft/sec = 48 ft/min

Area = 126 ft2

Air Flow = 126 ft2 X 48 ft/min = 6,048 CFM

**Magnehelic**

Magnehelic Reading – “See Magnehelic Picture”

Magnehelic Reading is 0.16 in H2O

Reflected as “Positive” [should use high pressure hose]

![A picture containing text, device, barometer, gauge

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A picture containing device, gauge, meter

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**2022 Southeast Regional Mine Rescue Contest Technician Team Test**

**Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Team\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

1. Turn the instrument on by pressing and holding the center [Enter] navigation button on the \_\_\_\_\_\_\_ front of the instrument for at least 3 seconds.
   1. Upper
   2. Middle
   3. Lower
2. Visually check the \_\_\_\_\_\_\_\_\_ for damage. Visually inspect the LCD display after it stabilizes.
   1. MX-6
   2. Detector
   3. Instrument
3. BATTERY STATUS – Under the main menu [\_\_\_\_\_\_] option, select [BATTERY] to view the battery status.
   1. CONFIGURE
   2. DISPLAY
   3. VIEW
4. When activated, instrument detects and measures concentration of carbon monoxide, methane, oxygen and nitrogen dioxide in the \_\_\_\_\_\_\_\_ air continuously and simultaneously.
   1. Mine
   2. Room
   3. Ambient
5. In case of an alarm, the sensor(s) in alarm will be \_\_\_\_\_\_\_\_ on the display.
   1. Highlighted
   2. Flashing
   3. Red
6. Atmospheric pressure – Force exerted by \_\_\_\_\_\_\_\_\_. Atmospheric pressure is measured on a barometer.
   1. Air
   2. Temperature
   3. Weather
7. \_\_\_\_\_\_\_\_\_ - To scatter, spread out, or blend.
   1. Disperse
   2. Diffuse
   3. Mix
8. Main fan – A mechanical ventilator installed at the surface which operates by either exhausting or blowing (pushing) to \_\_\_\_\_\_ airflow through the mine.
   1. Create
   2. Induce
   3. Cause
9. Regulator – An adjustable door or opening in a stopping/Bulkhead used to control and adjust the \_\_\_\_\_\_\_\_\_ of airflow in the mine in order to ensure proper distribution.
   1. Quantity
   2. Amount
   3. Volume
10. Return – the air course along which the ventilated air of the mine is \_\_\_\_\_\_\_\_\_ or conducted to the surface.
    1. Moved
    2. Conveyed
    3. Returned
11. Two gases that are highly soluble in water are hydrogen sulfide and \_\_\_\_\_\_\_\_\_\_\_
    1. Methane
    2. Nitrogen dioxide
    3. Sulfur dioxide
12. A gas that is normally found near the roof or in high place in the mine is said to have a \_\_\_\_\_ specific gravity.
    1. High
    2. Middle
    3. Low
13. Of the gases we’ve talked about, which ones are toxic if you inhale them?
    1. Carbon monoxide, nitrogen oxide, hydrogen sulfide, sulfur dioxide, and acetylene.
    2. Carbon monoxide, oxides of nitrogen, hydrogen sulfide, sulfur dioxide, and acetylene.
    3. Carbon monoxide, oxides of nitrogen, hydrogen sulfide, radon, and acetylene
14. Line Brattice – Line brattice is used to \_\_\_\_\_\_\_\_\_ intake air from the last open crosscut to the working face.
    1. Direct
    2. Divert
    3. Channel
15. Auxiliary Fans and Tubing – Auxiliary fans and tubing are used to provide \_\_\_\_\_\_\_\_ airflow to face areas during mining operations.
    1. Adequate
    2. Sufficient
    3. Needed