Purpose Review #1 for Friday's test.

WARM UP

"If you heat this to 300°c the size of the hole would (increase/decrease)"

Correct answer:
increase

manometers and barometers

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Come for assistance and cheerful encouragement after school Tues, Thurs, every day at lunch

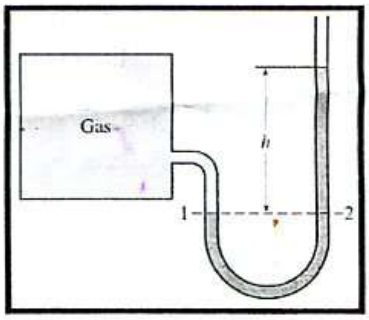
1. **What temperature is Absolute Zero supposed to always be?** Zero kelvins or -273 °C
2. **What special thing happens to matter at Absolute Zero?** all vibration stops
3. Which of the following is **not** standard pressure?

a. 1 atm b. 740 mm Hg c. 101.3 kPa d. 101300 Pa e. none

4. The temperature at which all vibration ("The Dance") stops is (circle one *or more* choices)

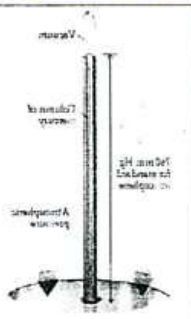
a. 0 °C b. -273 K c. 0 K d. 273 °C e. -273°C

5. If this manometer and box contained $2x10^{22}$ atoms of helium and then you added another $2x10^{22}$ atoms of helium, the height of liquid shown by "h" would
   a. decrease
   b. stay the same
   c. increase

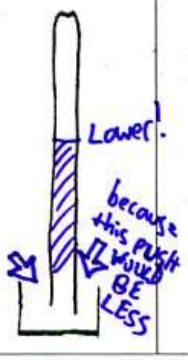


6. If the picture of this manometer and box was taken in a room in Madison (elevation 800 feet) but the box was later moved to Boulder, Colorado (useful elevation data is at the top of this page…) the height of liquid shown by "h" would
   a. decrease
   b. stay the same
   c. increase

7. Redraw how **the liquid height** would look different if …

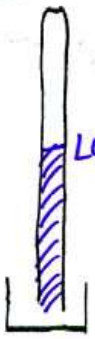


a) …if the weather caused a low pressure system in the area

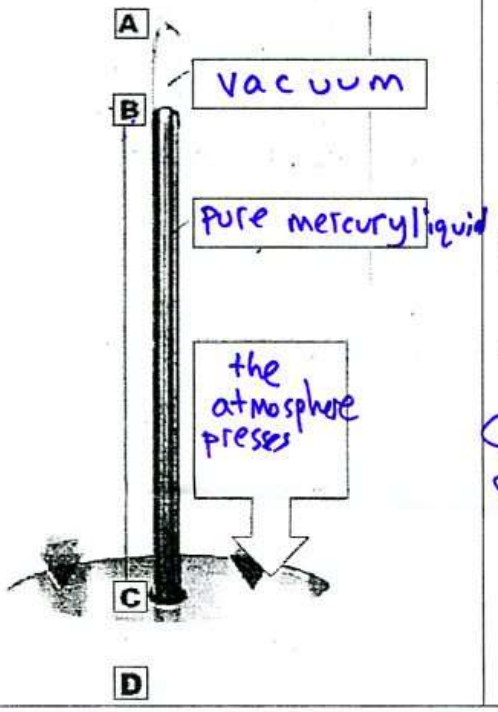


b) …if a liquid of less density were substituted for the mercury

c) …if instead of a vacuum there was a small amount of air int he top of the tube



d) …if the tube were open at the top instead of closed



8. Write these labels into the appropriate boxes of the diagram to the left:
   - the atmosphere presses here
   - pure mercury liquid
   - vacuum
9. The distance from A to B is
   a. meaningless and useless
   b. always 760 millimeters long at sea level on an average day
10. The distance from B to C is
   a. meaningless and useless
   b. always 760 millimeters long at sea level on an average day
11. The distance from C to D is
   a. meaningless and useless
   b. always 760 millimeters long at sea level on an average day

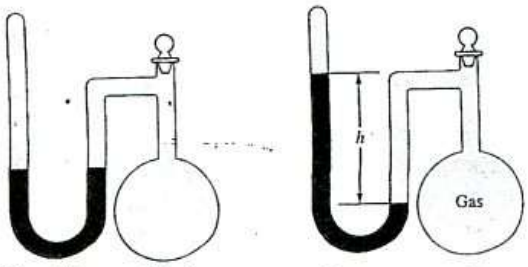
12. Convert 652.5 mmHg (lowest pressure ever recorded at sea level—inside Typhoon Tip) to

a. torr $652.5\ \text{mmHg} \times \left(\frac{760\ \text{torr}}{760\ \text{mmHg}}\right) = 652.5\ \text{torr}$

b. atm $652.5\ \text{mmHg} \times \left(\frac{1.000\ \text{atm}}{760.\ \text{mmHg}}\right) = 0.859\ \text{atm}$

c. kPa $652.5\ \text{mmHg} \times \left(\frac{101.3\ \text{kPa}}{760.\ \text{mmHg}}\right) = 87.0\ \text{kPa}$

13. A sealed-tube manometer as shown below, left, has a complete vacuum. The liquid mercury levels in both arms of the U-tube are equal. If a gas sample is introduced into the round flask, the mercury levels are different, as shown on the right.



The difference h is the measure of the pressure of the gas inside the flask. If h is equal to 6.5 cm, calculate the pressure in the flask in the following units:

a. mmHg

(Vacuum) + (H) = GAS

$\emptyset$ + 65 mmHg = gas

65 mmHg = gas

b. torr

65 torr

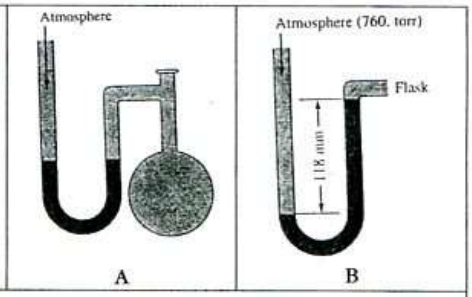
c. pascals

$65\ mmHg \times \left(\frac{101300\ Pa}{760\ mmHg}\right) = 8700\ Pa$

d. atmospheres

$65\ mm\ Hg \times \left(\frac{101\,300\ Pa}{760\ mmHg}\right) = 0.085\ atm$

14. A diagram for an open tube manometer is shown in Figure A; the flask is open to the atmosphere, the mercury levels are equal. In Figure B, a gas is now contained in the flask. Calculate the pressure in the flask in the four units given below.



a. mmHg

760 = (118) + (flask)

642 mmHg = flask

b. torr

642 torr

c. pascals

$642\ mmHg \times \left(\frac{101300\ Pascals}{760\ mmHg}\right) = 85600\ pascals$

d. atmospheres

$642\ mmHg \times \left(\frac{1.000\ atm}{760.\ mmHg}\right) = 0.845\ atm$