PART A. Circle the correct answer.

1. Which of the following statements expresses BOYLE'S LAW(PV relationship) ?

a) At a constant pressure, the volume of the gas is directly proportional to its temperature.

b) At a constant temperature, the volume of the gas is inversely proportional to its pressure.

c) At a constant pressure, the volume of the gas is inversely proportional to its temperature.

d) At a constant temperature, the volume of the gas is directly proportional to its pressure.

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2. Equal volumes of two different gases A and B are measured at the same pressure and temperature. The masses of the two volumes are:

Gas A: 1.4 g

Gas B: 3.5 g

If Gas A has a molar mass of 28 g/mole, what is the molar mass of Gas B ?

a) 2.5 g/mole b) 11 g/mole c) 35 g/mole d) 70 g/mole

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3. A sample of oxygen gas occupies a volume of 600 mL. If we triple the pressure of this gas while its temperature remains the same, its new volume will be:

a) 200 mL b) 100 mL c) 1800 mL d) 300 mL

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4. Consider the experimental set-up below. Case I is given and by changing only the temperature and pressure, Case II and Case III are achieved.

Case I contains 160 g of methane gas, CH_4.
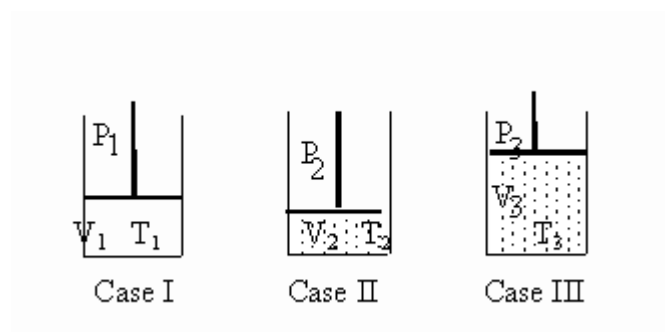
Which case, if any, contains the greatest number of molecules ?

a) Case I b) Case II c) Case III d) Each contains the same number.

5. A gas is confined in a sealed cylinder. Which of the following is true concerning the pressure of this gas when the absolute temperature is doubled ?

a) It is halved b) It is doubled c) It is tripled d) It remains the same

6. Sealed weather balloons are used to take certain meteorological measurements. When the balloons rise in the atmosphere, their volume changes. From the following factors, identify those which influence the balloon's change in volume.

1. Temperature 2. Type of gas 3. Pressure 4. Amount of gas in balloons

a) 1 and 2 b) 3 and 4 c) 1 and 3 d) 2 and 4

7.A container of a gas at 20°C is heated. What temperature must be reached if the pressure of the balloon is doubled?

a) 40°C b) 273°C c) 313°C d) 400°C

8.When a gas is compressed with no change in temperature:

a)The spaces between the molecules become smaller.

b)Its molecules become smaller in size.

c)Its molecules occupy more space.

d)The molecules move slower.

PART B. Answer the following questions on the space provided. (3 marks each).

9. Find the new pressure of a gas originally at 105 kPa and occupying 500 mL, after it is compressed to 100 mL while the temperature changes from 10 C to 40 C.

10.   Given: 2 $SO_{2(g)}$ + $O_{2(g)}$ --> 2 $SO_{3(g)}$

a. If 3.5 moles of oxygen are consumed in the oxidation of sulfur dioxide, how many litres of SO_3 will be produced at 300 K and at a pressure of 110 kPa?

b. If a 3.0 L tank at room temperature (20 C) is used to collect the sulfur trioxide that is produced from every gram of oxygen consumed, to what pressure will the SO_3 gas be subjected?