**PHYSICAL  CHEMISTRY**

**DPP**
DAILY PRACTICE PROBLEMS

**DPP  No. 23**

Total Marks : 28

Max. Time : 28 min.

**Topic : Gaseous State**

| Type of Questions | | M.M., Min. |
|---|---|---|
| Single choice Objective ('–1' negative marking) Q.1 to Q.5,8,9 | (3 marks, 3 min.) | [21, 21] |
| Multiple choice objective ('–1' negative marking) Q.6 | (4 marks, 4 min.) | [4, 4] |
| Short Subjective Questions ('–1' negative marking) Q.7 | (3 marks, 3 min.) | [3, 3] |

1.  If P, V, T represents the pressure, volume and temperature of gas respectively, then according to Boyle's law, which is correct for a fixed amount of ideal gas :

(A) $V \propto \dfrac{1}{T}$ (At constant P)

(B) $V \propto P$ (At constant T)

(C) $V \propto \dfrac{1}{P}$ (At constant T)

(D) $PV = nRT$

2.  If an ideal gas at 1 atmosphperic pressure, is spreading from 20 $cm^3$ to 50 $cm^3$ at constant temperature, then find the final pressure :
(A) 0.4 atm
(B) 2.5 atm
(C) 5 atm
(D) None of these.

3.  A vessel of 120 mL capacity contains a certain mass of an ideal gas at 20ºC and 750 mm pressure. The gas was transferred to another vessel, whose volume is 180 mL. Then the pressure of gas at 20ºC is :
(A) 500 mm
(B) 250 mm
(C) 1000 mm
(D) None of these

4.  5 L of a sample of a gas at 27°C and 1 bar pressure is compressed to a volume of 1000 mL keeping the temperature constant. The percentage increase in pressure is :
(A) 100 %
(B) 400 %
(C) 500%
(D) 80%

5.  For a fixed amount of ideal gas at constant temperature, which of the following plots is correct :
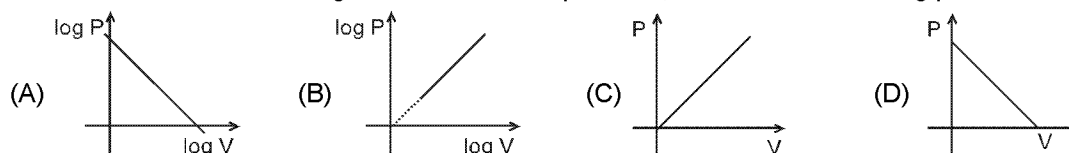


6.  For a fixed amount of ideal gas at constant temperature, which of the following plots is/are correct :
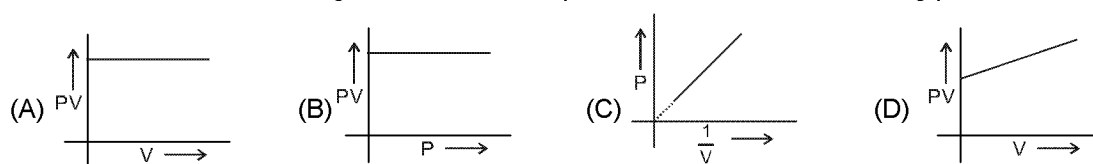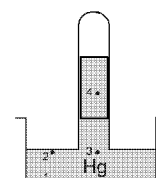


7.  What should be the percentage increase in pressure for a 5% decrease in volume of an ideal gas at constant temperature ?

8.  In which of the following cases is the pressure of air in air column maximum : (Assume same length of Hg column in each case) :



9.  Compare the values of pressure at different points in the given diagram :
(A) $P_1 > P_2 > P_3 > P_4$
(B) $P_1 < P_2 < P_3 < P_4$
(C) $P_1 > P_2 = P_3 > P_4$
(D) $P_1 < P_2 = P_3 < P_4$

# Answer Key

| 1. | (C) | 2. | (A) | 3. | (A) | 4. | (B) | 5. | (A) |
|----|-----|----|-----|----|-----|----|-----|----|-----|
| 6. | (ABC) | 7. | 5.26 | 8. | (A) | 9. | (C) | | |

# Hints & Solutions

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2.  $P_1 V_1 = P_2 V_2$

    $\therefore P_2 = \dfrac{1 \times 20}{50}$ atm $= 0.4$ atm **Ans.**

3.  $P_1 V_1 = P_2 V_2 \Rightarrow 750 \times 120 = P_2 \times 180$

    $\therefore P_2 = 500$ mm **Ans.**

4.  $P_2 = \dfrac{1 \times 2.5}{0.5} = 5$ atm $\Rightarrow$ $\therefore$ % increase $= \dfrac{5-1}{1} \times 100 = 400\%$

7.  Given, $P_1 = P$, $V_1 = V$, $T_1 = T$ $\Rightarrow$ $P_2 = P_2$, $V_2 = V - \dfrac{5V}{100}$, $T_2 = T$

    $P \times V = P_2 \times \left( V - \dfrac{5V}{100} \right)$ ; $P_2 = \dfrac{100}{95} P$ $\Rightarrow$ $\therefore P_2 = 1.0526 P$

    $\therefore$ Increase in $P = 0.0526$ $\Rightarrow$ $\therefore$ % increase in $P = 0.0526 \times 100 = 5.26$ **Ans.**