DPP 1 GAS LAW

1. Fill in the blank spaces with appropriate words given within the brackets.

(i) Pressure remaining constant, the _____ (mass/volume) of an enclosed gas is directly proportional to the kelvin temperature.

(ii) The product of pressure and volume of a given mass of an enclosed gas at a fixed temperature is a constant quantity. This law was stated by _____ (Charles/Boyle).

(iii) At kelvin zero the molecular motion is _____ (zero/maximum).

(iv) 1K rise in temperature is equal to _____ °C (1/274) rise in temperature.

(v) 100K is equal to _____ °C (–173°C / 100°C).

2. Match the coloumn

(i) Thermometeric scale having lowest temperature zero K	Boyle's law
(ii) A relation between pressure and volume at constant temperature	Perfect gas equation
(iii) A temperature at which molecular motion stops	Kelvin scale
(iv) A relation between volume and temperature at constant pressure	Kelvin zero
(v) Relation between pressure, volume and temperature of a gas	Charles' law

3. Statements given below are incorrect. Write the correct statements.

(i) Temperature remaining constant, the volume of a fixed mass of gas is directly proportional to pressure.

(ii) Pressure remaining constant, the volume of a fixed mass of a gas is inversely proportional to Celsius temperature.

(iii) The zero degree Celsius is the temperature at which the molecules of a gas have zero kinetic energy.

(iv) Rise in temperature of 1 K is equal to rise in temp of 274°C.

(v) The standard pressure of a gas is 760 cm of mercury.

4. State whether the statements given below are true or false.

(i) Gases exert same pressure in all directions.

(ii) Gases are not compressible.

(iii) Gases have definite shape, but no definite volume.

(iv) Gases diffuse easily in one another.

(v) Gases can occupy any amount of space.

(vi) Gases have higher density as compared to other states of matter.

5. (a) Define Boyle's law.
(b) State Boyle's law equation, giving the meaning of each symbol.
(c) The product of pressure and volume for a given mass of an enclosed gas is a constant quantity at some fixed temperature. Is this statement true?Which physical law about gases represents the above statement.

DPP 2

1. A gas occupies 75 litres at a pressure of 700 mm of mercury. Calculate the pressure, if volume increases to 100 litres, the temperature remaining constant.

2. Calculate the pressure of a gas, when its volume is 750 ml, initially the gas having a volume of 1250 ml and pressure 0.8 atmospheres. Assume the temperature is constant.

3. 5 dm^3 of dry oxygen is allowed to expand to 7 m^3, when the pressure recorded is 700 mm of mercury. Find the initial pressure of the gas, assuming temperature remains constant.

4. At a constant temperature, a gas at a pressure of 1200 mm of mercury occupies a volume of 1500 cm^3. If the volume is decreased by 30%, calculate the new pressure.

5. *A dry gas occupies 224 cm^3 at normal pressure. If the volume increases by* 25%, find the new pressure of the gas, assuming temperature remain constant.

6. 10 dm^3 of oxygen is contained in a vessel at a pressure of 20 atms. If another evacuated vessel of similar capacity is connected to it, calculate the common pressure of the gas in both the vessels.

7. A vessel of capacity 6 dm^3 contains nitrogen gas at a pressure of 152 cm of mercury. If this vessel is connected to another evacuated vessel of 3 dm^3 capacity, what will be the pressure of nitrogen in both the vessels?

8. **(a)** Define kelvin zero and kelvin scale of temperature.

(b) What do you understand by the term standard temperature? Express its value on the kelvin scale.

(c) Convert the following celsius temperature into kelvin.

(1)– 16 (2)57

(d) Convert the following kelvin temperatures to celsius.

(1)21 (2)289

GAS LAWS DPP 3

1. **(a)** Define Charles' law.

   (b) State Charles' law equation, stating clearly the meaning of the symbols used.

2. A gas occupies 200 cm^3 at a temperature of 27 °C and 76 mm pressure of mercury. Find its volume at –3 °C and 76 cm of mercury.

3. A gas at constant pressure occupies a volume of 300 cm^3, at a temperature of –73 °C. Find its volume at 127 °C, pressure remaining constant.

4. A gas occupies 150 cm^3 at 57°C. Find the temperature to which the gas must be heated, so that its volume triples, without any change in pressure.

5. A gas occupies a volume of 400 cm^3. On heating at 127 °C its volume becomes 1600 cm^3. Find the initial temperature of the gas on Celsius scale. Assume pressure remains constant.

6. To what temperature must a gas at 127 °C be cooled, so that its volume is reduced to 1/5 of its initial volume? Assume pressure remains constant.

7. At a constant pressure, a gas at –33 °C is heated to 127 °C. Find the percentage increase in volume of the gas.

7. **(a)** What do you understand by the term S.T.P.?

   (b) State the perfect gas equation, stating clearly the meaning of the symbols used.

8. A gas occupies 1.12 dm^3 at a temperature of 127 °C and pressure 800 mm of mercury. Calculate its volume at S.T.P.

9. At 0 °C and 760 mm mercury pressure, a gas occupies a volume of 100 cm^3. The Kelvin temperature of the gas is increased by 1/5, while pressure is increased by one and a half times. Calculate the final volume of the gas.