Write the answers to the following questions in your exercise/activity books.

Strand 2: Investigating Matter	Sub-strand: States of Matter

1. Name the laws and principles which forms the basis of the **ideal gas law**. **(3 marks)**

2. A sample of oxygen gas was collected over water at 20 °C and 101.5 kPa and was found to occupy a volume of 25 mL.

   Calculate the mass of oxygen gas collected. **(3 marks)**

   (SVP of water at 20 °C = 2 kPa, R = 8.314 J K^{-1} mol^{-1}, M_{O_2} = 32 g mol^{-1})

3. A marathon runner made a drink by dissolving 50 g of glucose ($C_6H_{12}O_6$) in 500 mL of water.

   Calculate the mole fraction of glucose in the solution.
   ($M_{glucose}$ = 180 g mol^{-1}, M_{H_2O} = 18 g mol^{-1}) **(3 marks)**

4. Differentiate between **molality** and **molarity**. **(2 marks)**

5. A solution was made by dissolving 5 g of calcium chloride in 25 mL of water.

   Calculate the molarity of the solution. (M_{CaCl_2} = 111 g mol^{-1}) **(2 marks)**

6. State the definitions of the following:

   (i)   Weight percent **(1 mark)**

   (ii) Volume percent **(1 mark)**

7. A diluted ethanol solution was made by adding 50 mL of ethanol in enough water to make a 250 mL ethanol solution.

   Calculate the volume percent of ethanol in the diluted solution. **(2 marks)**

The End