**Name of the Student**:_____

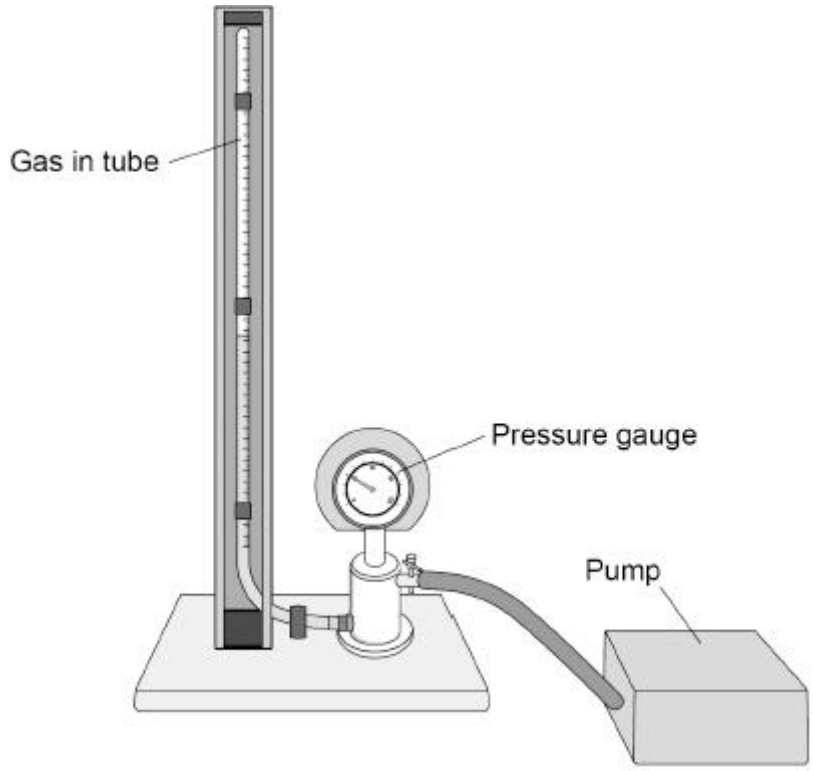
**Max. Marks : 18 Marks** **Time : 18 Minutes**

## Q1.

A teacher demonstrated the relationship between the pressure and the volume of a fixed mass of gas at a constant temperature.

**Figure 1** shows the equipment used.

**Figure 1**




(a) Complete the sentence.

Choose the answer from the box.

| | | |
|---|---|---|
| **circular paths** | **random directions** | **the same direction** |

Particles in a gas move in _____.

**(1)**

(b) Complete the sentence.

Choose the answer from the box.

| a constant speed | a constant velocity | a range of speeds |
|---|---|---|

Particles in a gas move with _____.

**(1)**

(c) The table below shows some of the results.

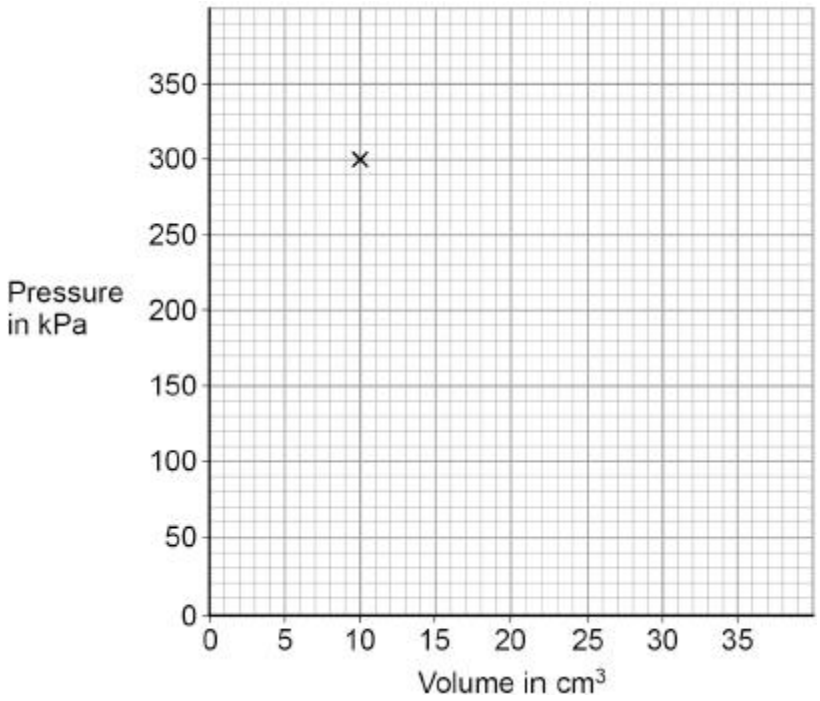
| Pressure in kPa | Volume in $cm^3$ |
|---|---|
| 300 | 10 |
| 200 | 15 |
| 150 | 20 |
| 120 | 25 |
| 100 | 30 |

Complete **Figure 2**. The first point has been plotted for you.

You should:

- plot the points from the table above
- draw the line of best fit.

**Figure 2**




**(3)**

(d) The relationship between the pressure and the volume of a gas is given by the equation:

pressure × volume = constant

Calculate the constant when the pressure of the gas was 300 kPa.

Use the table above.

_____

_____

_____

_____

Constant = _____ kPa $cm^3$

**(2)**

(e) When the volume of the gas increases, the pressure in the gas decreases.

The temperature of the gas stays the same.

How does increasing the volume affect each of the following quantities?

Tick (✓) **one** box in **each** row.

| **Quantity** | **Decreases** | **Stays the same** | **Increases** |
|---|---|---|---|
| Mean time between collisions of the particles with the tube | | | |
| Mean distance between the particles | | | |
| Mean speed of the particles | | | |

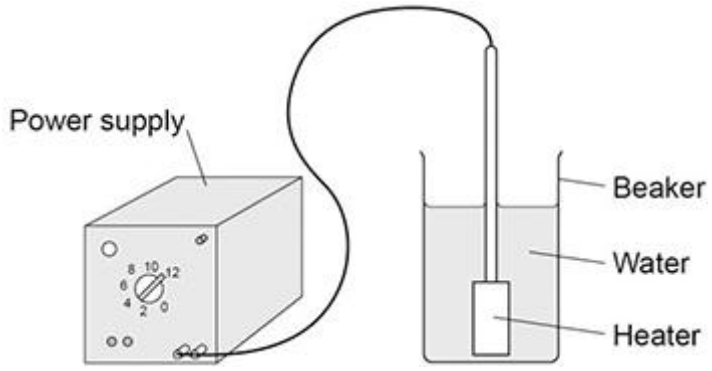
**(3)**

**(Total 10 marks)**

## Q2.

A student determined the specific latent heat of vaporisation of water.

The figure shows some of the equipment used.




(a) The student measured a mass of water and put it into the beaker.

What measuring instrument should the student have used to measure the mass of the water?

Tick (✓) **one** box.

balance ☐

joulemeter ☐

newtonmeter ☐

thermometer ☐

**(1)**

(b) The power output of the heater stayed the same throughout the experiment.

What type of variable was the power output of the heater?

Tick (✓) **one** box.

Categoric variable ☐

Control variable ☐

Dependent variable ☐

Independent variable ☐

**(1)**

(c) The student turned on the heater and heated the water until it reached boiling point.

The student continued to heat the water so that it boiled for several minutes.

The mass of the water remaining in the beaker was measured again.

Give **one** way the beaker of boiling water could be moved safely to measure its new mass.

_____

_____

_____

**(1)**

(d) The mass of water that turned into steam was 0.0090 kg.

The heater transferred 25 200 J of energy to the water to turn it into steam.

Calculate the specific latent heat of vaporisation of water given by the student s data.

Use the Physics Equations Sheet.

Choose the unit from the box.

| | | |
|---|---|---|
| **J** | **kg** | **J/kg** |

_____

_____

_____

_____

Specific latent heat of vaporisation = _____ Unit _____

**(4)**

(e) What was a source of error in the student s experiment?

Tick (✓) **one** box.

| | |
|---|---|
| The transfer of thermal energy from the heater to the water | ☐ |
| The transfer of thermal energy from the surroundings to the water | ☐ |
| The transfer of thermal energy from the water to the heater | ☐ |
| The transfer of thermal energy from the water to the surroundings | ☐ |

**(1)**

**(Total 8 marks)**