Name of the Student:_____

Max. **Marks : 19 Marks**   **Time : 19 Minutes**

Q1.

A student uses the apparatus in Figure 17 to determine the specific heat capacity of water.

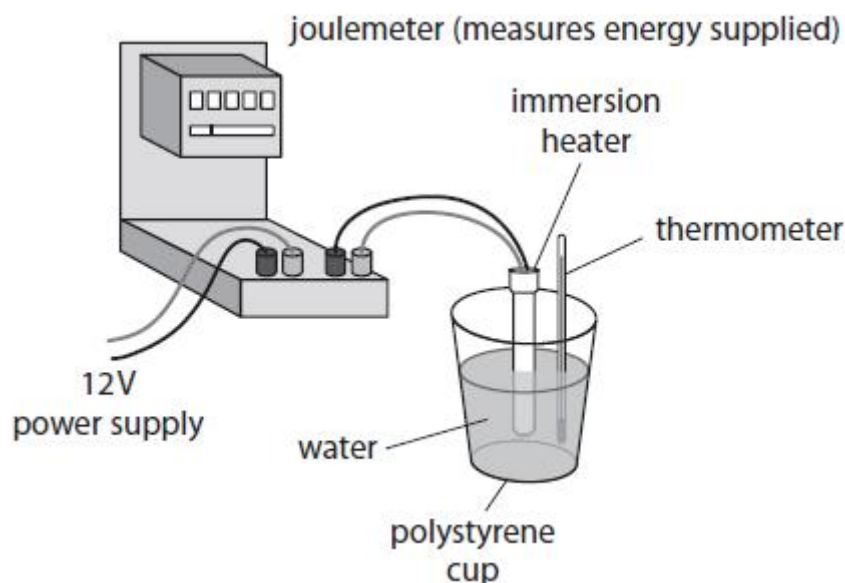**Figure 17**

(i) State the measurements needed to calculate the specific heat capacity of water.

(4)

....
....
....
....
....
....
....
....

(ii) State **two** ways that the apparatus could be adapted to improve the procedure.

(2)

1 ....
....
2 ....
....

(Total for question = 6 marks)

Q2.

A student sets up an experiment to measure the specific heat capacity of a metal.
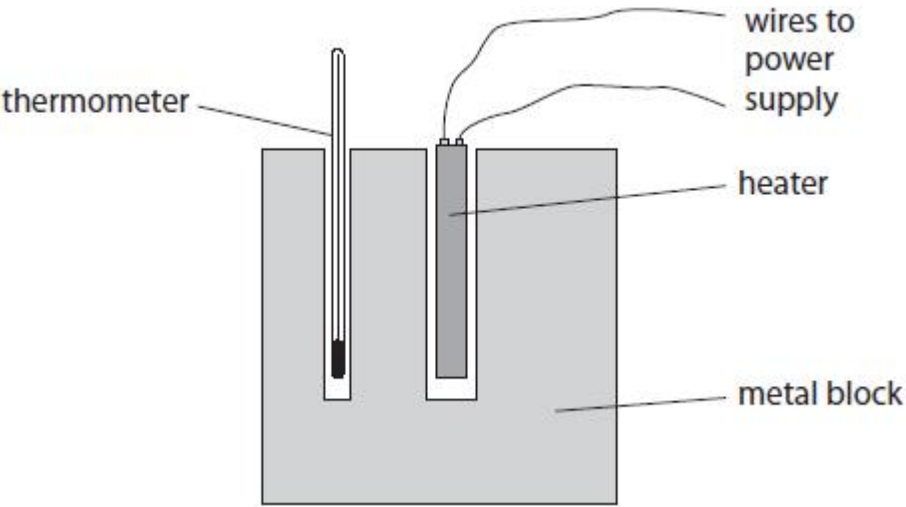
Figure 8 shows the apparatus.

Figure 8

The heater is connected to a power supply and has a power of 50 W.

The student switches on the heater and measures the temperature rise after 5 minutes.

(i) State **two** improvements the student could make to the experiment.

(2)

1 ....

....

2 ....

....

(ii) Figure 9 shows the student's results.

mass of metal block	0.92 kg
power of heater	50 W
starting temperature	20 °C
finishing temperature	54 °C
time	300 s

Figure 9

Use the data in Figure 9 to calculate a value for the specific heat capacity of the metal.
Use the equation

$$\text{specific heat capacity} = \frac{\text{power} \times \text{time}}{\text{mass} \times \text{temperature rise}}$$

(3)

specific heat capacity = ... J/kg °C

(Total for question = 5 marks)

Q3.

A student investigates the pressure and volume of some trapped gas.
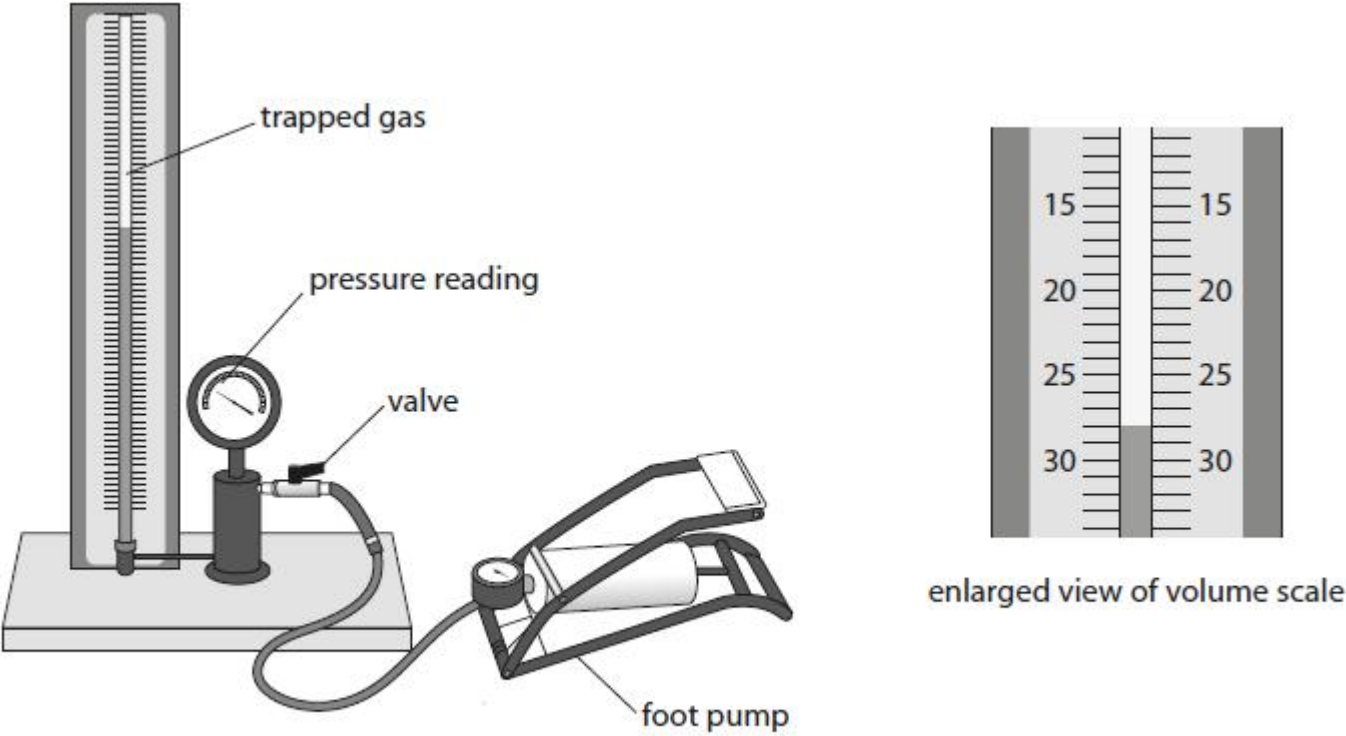Figure 4 shows the apparatus used.

Figure 4

enlarged view of volume scale

Figure 5 shows the student's table of results.

p	V	p × V
100	28.0	2800
123	23.0	2829
140	20.0	2800
160	18.0	2880
180	16.5	2970

Figure 5

(i) Suggest what the student should add to the headings of the table in Figure 5.

(1)

....

....

(ii) Use Figure 5 to estimate the volume of gas for a pressure reading of '170'.

(2)

volume of gas = ...

(iii) Suggest **two** ways the student could improve the investigation.

(2)

1 ....

....

2 ....

....

(iv) Explain whether the values, in the column headed '$p \times V$' in Figure 5, fit the equation

$$p_1 \times V_1 = p_2 \times V_2$$

(3)

....

....

....

....

....

....

(Total for question = 8 marks)