

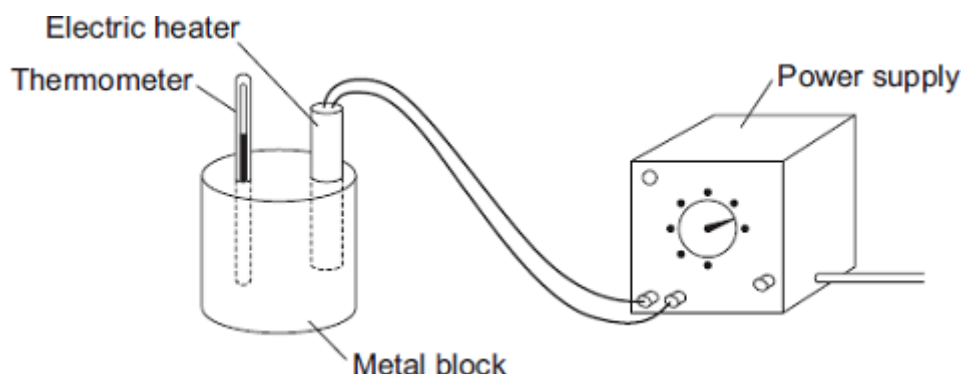
Name of the Student: _____

Max. Marks : 19 Marks

Time : 19 Minutes

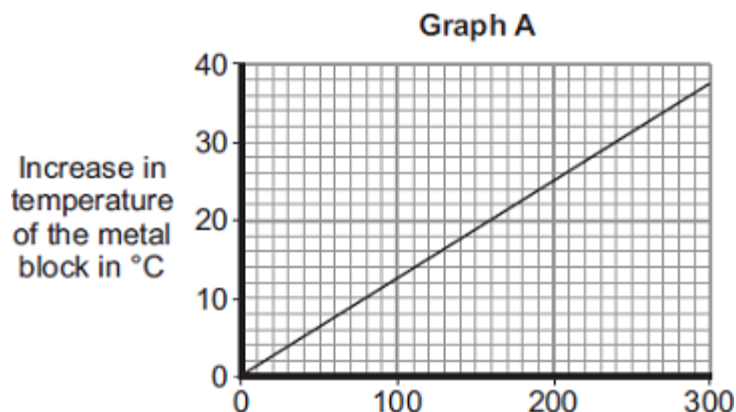
Q1.

- (a) A student used the apparatus drawn below to investigate the heating effect of an electric heater.



- (i) Before starting the experiment, the student drew **Graph A**.

Graph A shows how the student expected the temperature of the metal block to change after the heater was switched on.

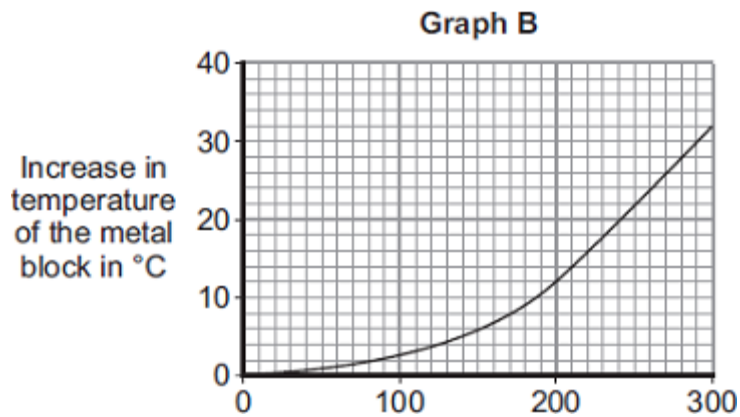


Describe the pattern shown in **Graph A**.

(2)

- (ii) The student measured the room temperature. He then switched the heater on and measured the temperature of the metal block every 50 seconds.

The student calculated the increase in temperature of the metal block and plotted **Graph B**.



After 300 seconds, **Graph B** shows the increase in temperature of the metal block is lower than the increase in temperature expected from **Graph A**.

Suggest **one** reason why.

(1)

- (iii) The power of the electric heater is 50 watts.

Calculate the energy transferred to the heater from the electricity supply in 300 seconds.

Energy transferred = _____ J

(2)

- (b) The student uses the same heater to heat blocks of different metals. Each time the heater is switched on for 300 seconds.

Each block of metal has the same mass but a different specific heat capacity.

Metal	Specific heat capacity in J/kg°C
Aluminium	900
Iron	450
Lead	130

Which **one** of the metals will heat up the most?

Draw a ring around the correct answer.

aluminium

iron

lead

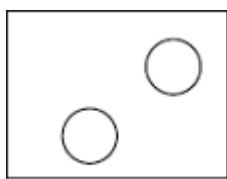
Give, in terms of the amount of energy needed to heat the metal blocks, a reason for your answer.

(2)

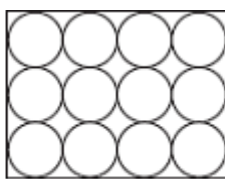
(Total 7 marks)

Q2.

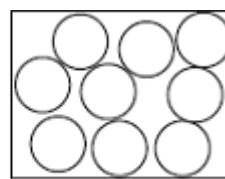
- (a) The diagrams, **X**, **Y** and **Z**, show how the particles are arranged in the three states of matter.



X



Y



Z

- (i) Which **one** of the diagrams, **X**, **Y** or **Z**, shows the arrangement of particles in a liquid?

Write the correct answer in the box.

(1)

- (ii) Which **one** of the diagrams, **X**, **Y** or **Z**, shows the arrangement of particles in a gas?

Write the correct answer in the box.

(1)

- (b) Draw a ring around the correct answer in each box to complete each sentence.

- (i) In a gas, the particles are

vibrating in fixed positions.
moving randomly.
not moving.

(1)

- (ii) In a solid, the forces between the particles are

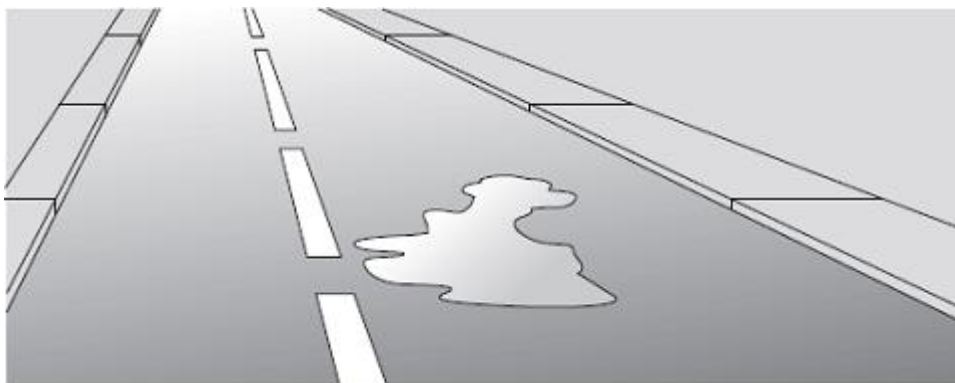
stronger than
equal to
weaker than

the

forces between the particles in a liquid.

(1)

- (c) The picture shows a puddle of water in a road, after a rain shower.



- (i) During the day, the puddle of water dries up and disappears. This happens because the water particles move from the puddle into the air.

What process causes water particles to move from the puddle into the air?

Draw a ring around the correct answer.

condensation

evaporation

radiation

(1)

- (ii) Describe **one** change in the weather which would cause the puddle of water to dry up faster.

(1)

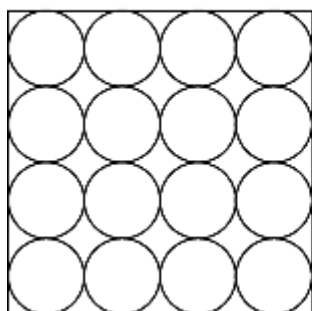
(Total 6 marks)

Q3.

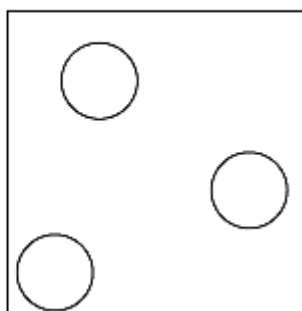
- (a) The diagrams show the arrangement of the particles in a solid and in a gas.

Each circle represents one particle.

Solid

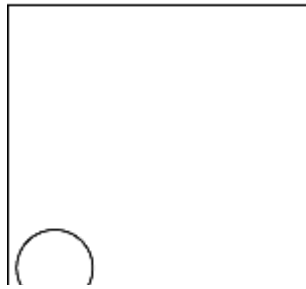


Gas



- (i) Complete the diagram below to show the arrangement of the particles in a liquid.

Liquid



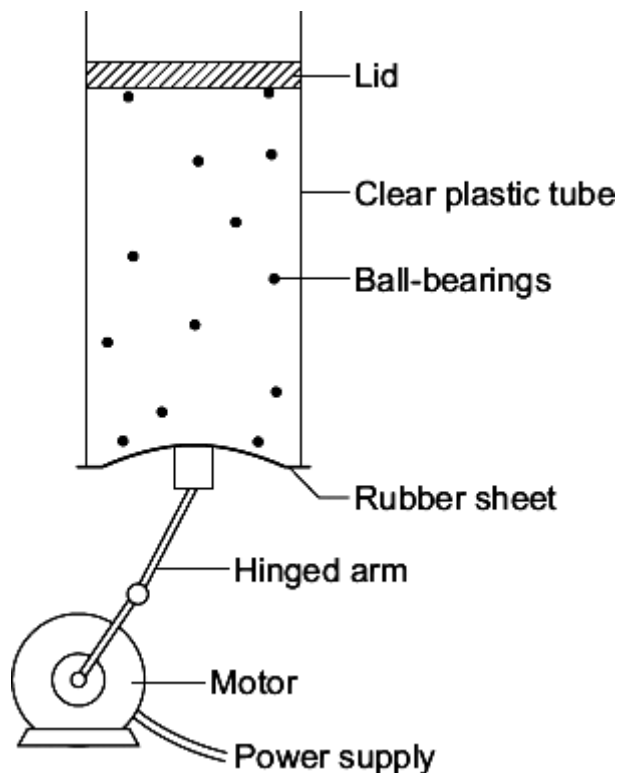
(2)

- (ii) Explain, in terms of the particles, why gases are easy to compress.

(2)

- (b) The diagram below shows the model that a science teacher used to show her students that there is a link between the temperature of a gas and the speed of the gas particles.

The ball-bearings represent the gas particles. Switching the motor on makes the ball-bearings move around in all directions.



- (i) How is the motion of the ball-bearings similar to the motion of the gas particles?

(1)

- (ii) The faster the motor runs, the faster the ball-bearings move. Increasing the speed of the motor is like increasing the temperature of a gas.

Use the model to predict what happens to the speed of the gas particles when the temperature of a gas is increased.

(1)

(Total 6 marks)