Thermal Properties and Temperature – 2019 Nov

1.

A test-tube contains 1.0 cm^3 of liquid water at 100 °C. The liquid water boils to form 1600 cm^3 of steam.

What is the reason for the large increase in volume?

A Steam molecules are bigger than water molecules.

B The average distance between the molecules is much greater in the steam.

C The molecules do not move until the water turns into a gas.

D There are more steam molecules than there were water molecules.

2.

Which statement about the evaporation of a liquid is correct?

A The least energetic molecules escape from the surface and the temperature of the liquid decreases.

B The least energetic molecules escape from the surface and the temperature of the liquid increases.

C The most energetic molecules escape from the surface and the temperature of the liquid decreases.

D The most energetic molecules escape from the surface and the temperature of the liquid increases.

3.

Which effect is caused by thermal expansion?

A a metal surface heating up in direct sunlight

B ice-cream melting on a hot day

C a railway track buckling on a hot day

D ice forming on a pond on a cold day

4. 0625/11/O/N/19/No.17

A liquid-in-glass thermometer uses a change in a property of a liquid to measure temperature.

Which property is used?

A mass

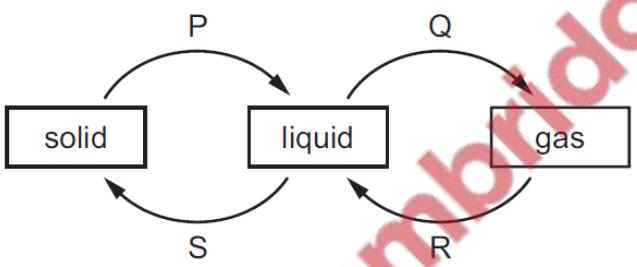
B thermal capacity

C volume

D weight

5. 0625/11,12,13/O/N/19/No.18

The diagram shows four labelled changes of state between solid, liquid and gas.



Which changes need an energy input?

A P and Q **B** Q and R **C** R and S **D** S and P

6. 0625/12/O/N/19/No.14

Which row describes the arrangement and the motion of the molecules in a gas?

	arrangement	motion
A	far apart	move freely
B	far apart	vibrate only
C	tightly packed	move freely
D	tightly packed	vibrate only

7. 0625/12/O/N/19/No.15

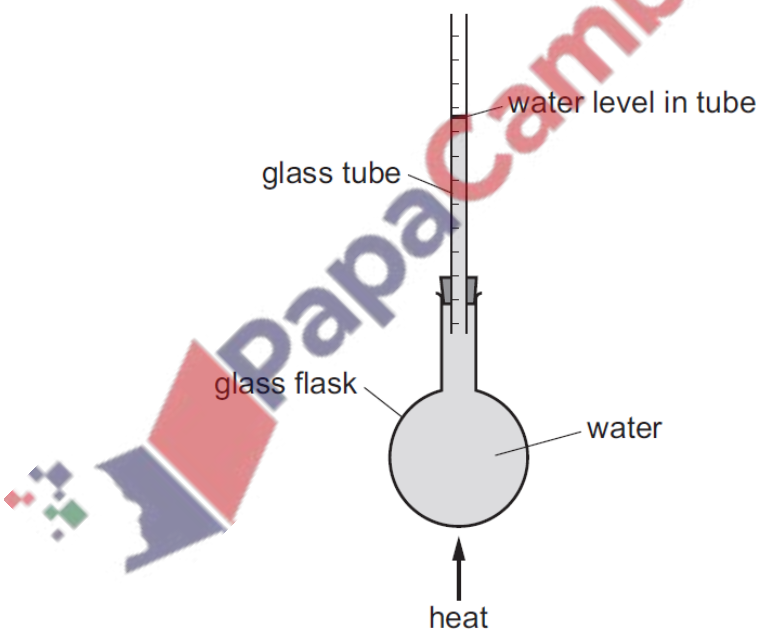
A driver of a car measures the pressure of the air in the tyres. He measures the pressure again after a long journey. The pressure reading has increased.

Which row states what has happened to the speed of the air molecules and the temperature of the air in the tyres?

	speed of molecules	temperature
A	decreases	decreases
B	decreases	increases
C	increases	decreases
D	increases	increases

8. 0625/12/O/N/19/No.16

Some water in a glass flask is gently heated.



Why does the water level in the glass tube rise during heating?

A Only the glass flask expands.

B Only the water expands.

C The glass flask expands more than the water.

D The water expands more than the glass flask.

9. 0625/12/O/N/19/No.17

What is the temperature difference between the fixed points on the °C temperature scale?

A 10 °C **B** 100 °C **C** 110 °C **D** 120 °C

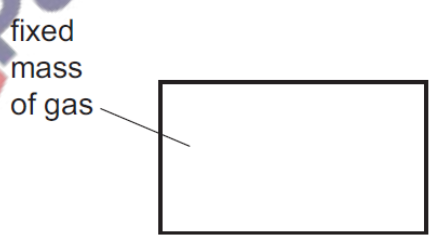
10. 0625/13/O/N/19/No.14

Which row compares the separation and the motion of the molecules of a hot gas with those of a cool liquid? (Both the gas and the liquid are at the same pressure.)

	separation	motion
A	greater for a gas	faster for a gas
B	greater for a gas	slower for a gas
C	smaller for a gas	faster for a gas
D	smaller for a gas	slower for a gas

11. 0625/13/O/N/19/No.15

A fixed mass of gas is trapped in a container. The temperature of the gas is increased but the volume of the gas is kept constant.

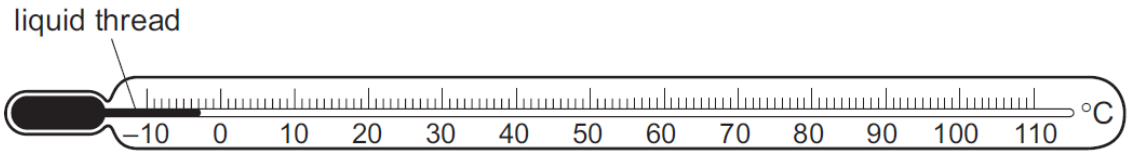


How does this change affect the kinetic energy of the molecules and the pressure on the walls of the container?

	kinetic energy	pressure
A	increases	increases
B	stays the same	increases
C	increases	decreases
D	decreases	increases

12. 0625/13,23/O/N/19/No.16,18

The diagram shows a liquid-in-glass thermometer.



When the temperature of the thermometer rises, the changes produced cause the liquid thread to move to the right.

Why does this happen when the temperature of the thermometer rises?

A Gases contract and liquids expand.

B Gases contract and solids expand.

C Liquids expand more than gases.

D Liquids expand more than solids.

13. 0625/13/O/N/19/No.17

A liquid-in-glass thermometer has a range from –10 °C to 110 °C.

What are the fixed point temperatures used when calibrating this thermometer in °C?

A –10 °C and 0 °C

B –10 °C and 110 °C

C 0 °C and 100 °C

D 0 °C and 110 °C

14. 0625/21/O/N/19/No.15

Which statement about the evaporation of a liquid is correct?

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15. 0625/21/O/N/19/No.17

Which change in the design of a liquid-in-glass thermometer makes it more sensitive?

A a larger liquid reservoir

B a longer tube

C a smaller liquid reservoir

D a wider tube

16. 0625/21,23/O/N/19/No.18,17

A liquid turns into a gas. This occurs only at one particular temperature, and the change happens throughout the liquid.

What is this process called?

A boiling

B condensation

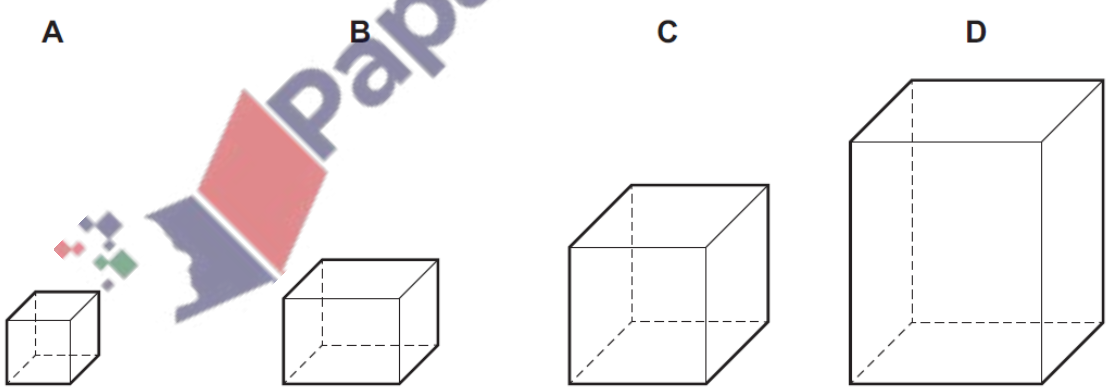
C evaporation

D fusion

17. 0625/22/O/N/19/No.18

The same quantity of thermal energy is supplied to each of four blocks. Each block is made from a different material.

Which block has the greatest thermal capacity?



18. 0625/22/O/N/19/No.19

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