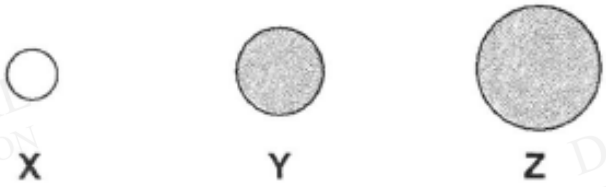
O Level Pure Physics MCQs

Thermal Properties of Matter Test 1.0

Q1

The diagram shows three spheres **X**, **Y** and **Z** of different sizes. Spheres **X** and **Y** are in thermal equilibrium. Spheres **Y** and **Z** are made from the same material while sphere **X** is made from a different material.



Which of the following statements is true?

A **X** and **Y** have the same specific heat capacity.
B **Y** has a lower heat capacity than **Z**.
C The temperature of **Y** is higher than that of **X**.
D There is a net transfer of thermal energy if **X** is placed in contact with **Y**.

Q2

The energy required to change liquid water into water vapour at the same temperature is called the latent heat of vaporisation. What does this energy do?

A increases the average separation of the water molecules
B increases the average speed of the water molecules
C raises the temperature of the air near the water
D splits the water molecules into their separate atoms

Q3

A jet of steam at 100 ^{0}C is directed for a short time on a large block of ice at 0 ^{0}C. Some of the steam condenses to form 0.40 kg of water at 100 ^{0}C.

What is the heat given out by the steam that changed to water at 100 ^{0}C?

specific latent heat of vaporization of water = 2200 kJ/kg;
specific heat capacity of water = 4.2 kJ/kg K

A 440 kJ **B** 880 kJ **C** 1680 kJ **D** 88000 kJ

Q4

Fig. 20.1 shows the rise in temperature of 2.0 kg of a substance, X. The substance is initially in solid state and it was heated uniformly at the rate of 2000 J/min.

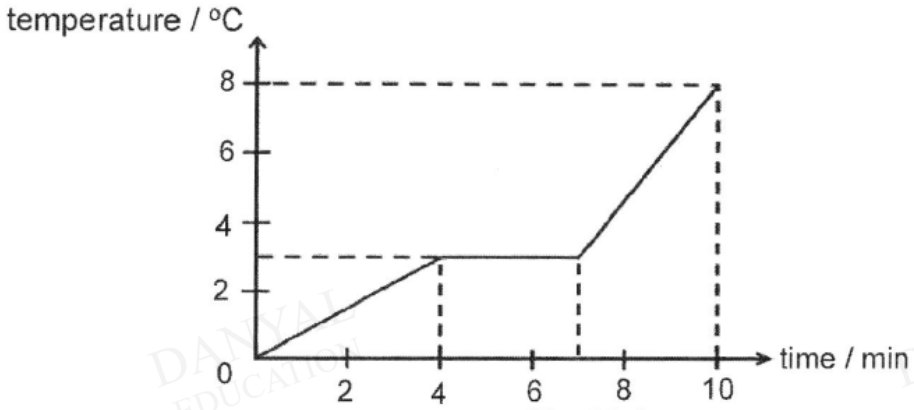


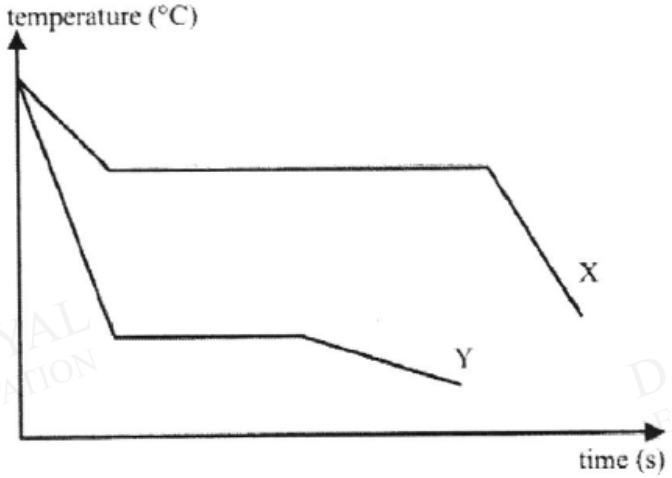
Fig. 20.1

Which of the following sets of data about X is correct?

	specific heat capacity of solid X / J kg^{-1} $°C^{-1}$	specific latent heat of fusion of X / J kg^{-1}	specific heat capacity of liquid X / J kg^{-1} $°C^{-1}$
A	8000	6000	3000
B	1330	6000	600
C	4000	3000	1200
D	1330	3000	600

Q5

Two liquids, X and Y, are cooled in air. Their cooling curves are shown below.



If liquids X and Y have the same mass, which of the following statements is/are correct?

I X has a higher melting point than Y

II X has a larger specific latent heat of fusion than Y

III Liquid X has a greater specific heat capacity than liquid Y.

A I only **B** II only **C** I and II only **D** All of the above

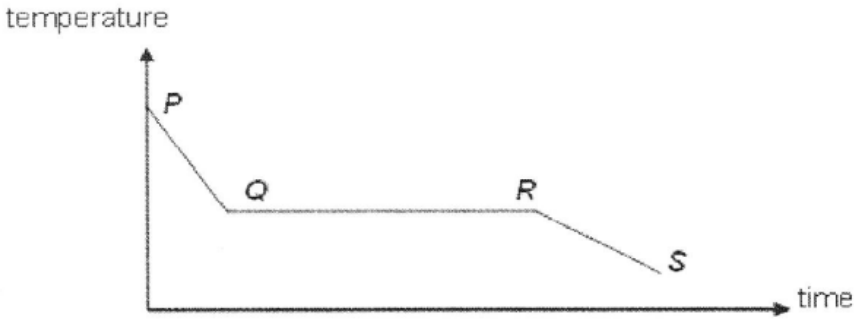
Q6

In cars, a coolant is used to help dissipate the heat from the engine to the other parts of the car. The liquid that is used as a coolant in motor car engines should have a

A high specific heat capacity
B low specific heat capacity
C high specific latent heat of vaporization
D low specific latent heat of vaporization

Q7

The graph shows how the temperature of a sample of molten wax changes as it cools.



Which statement is correct?

A From P to Q, the molecules lose internal energy and molecules move more slowly.
B From Q to R, latent heat is given out to the surroundings and intermolecular forces of attraction decrease.
C From Q to R, the molecules come closer together and internal energy increases.
D From R to S, latent heat is given out to the surroundings and intermolecular forces of attraction increases.

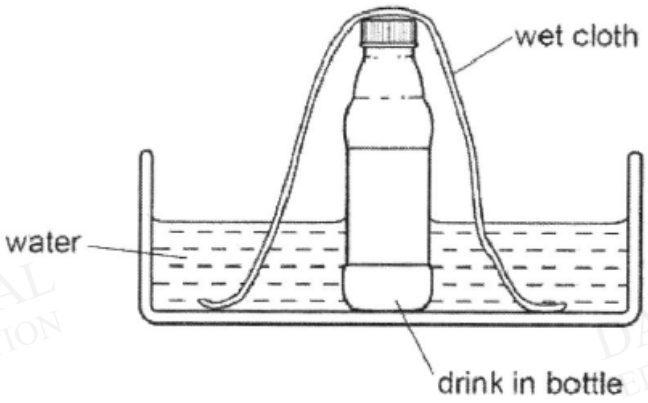
Q8

Which of the following correctly shows the changes to the potential energy and the kinetic energy of the molecules of a liquid as it boils?

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

Q9

The diagram shows a drink in a bottle placed in a bowl of water on a hot day.



The drink is kept cool by placing a wet cloth over it.

Which statement correctly explains why the drink is kept cool?

A Hot air cannot escape from the bottle.

B The cloth conducts heat from the bottle into the water.

C The drink cannot evaporate from the bottle.

D Water evaporating from the cloth cools the drink.

Q10

Using the kinetic model of matter, which of the following best describes water at 0 °C that is freezing to ice?

	intermolecular bonds	average motion of water molecules
A	forming	slowing down
B	being overcomed	slowing down
C	forming	no change
D	being overcomed	no change

Answers

Thermal Properties of Matter Test 1.0

Q1 B

Q2 A

Q3 B

Q4 D

Q5 D

Q6 A

Q7 A

Q8 B

Q9 D

Q10 C