

O Level Combined Physics Structured

Thermal Properties of Matter Test 1.0

Q1

Fig. 11.2 shows a puddle of water on the road after it has rained.

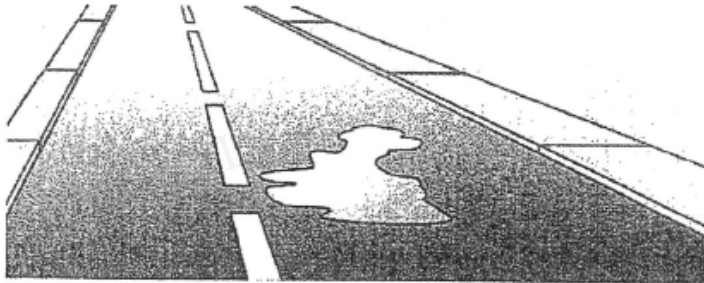


Fig. 11.2

(i) State the process that causes the water to dry up after some time.

..... [1]

(ii) Describe **two** changes in weather which would cause the puddle of water to dry up faster.

.....
..... [2]

Q2

(a) Describe what happens to the molecules in water as its temperature rises. [2]

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

Q3

A student slowly heats a sample of solid wax in a test-tube.
Fig. 5.1 shows how the temperature of the wax varies with time t .

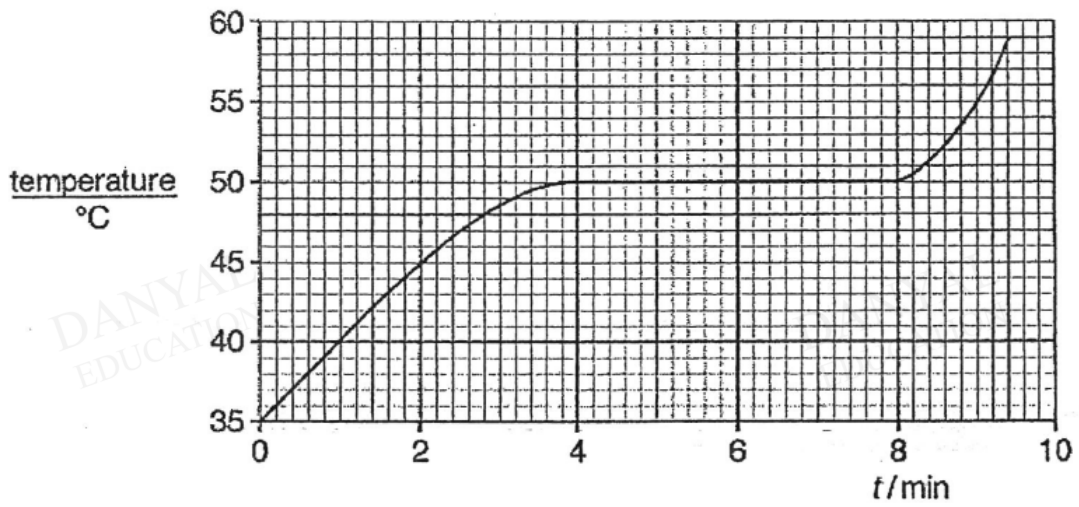


Fig. 5.1

(a) State the melting point of the wax.

.....[1]

(b) Name the physical states of the wax at the following times:

(i) 2 min.....

(ii) 6 min.....

(iii) 9 min.....

[2]

(c) State whether the kinetic energy and the potential energy of the molecules *increases*, *decreases* or *does not change* during the time interval of 4 min to 8 min.

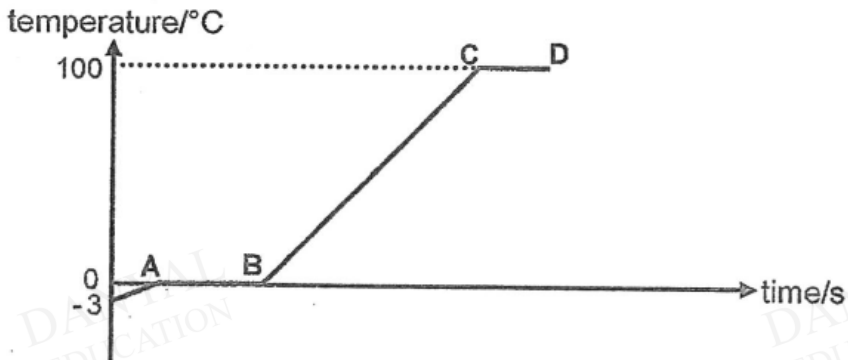
kinetic energy.....

potential energy.....

[1]

Q4

A small quantity of substance X is heated from a temperature of $-3\text{ }^{\circ}\text{C}$ using a 200 W heater. The graph below shows how the temperature of the substance varies with time.



a) What is the melting point of substance X?

[1]

.....

b) Using the Kinetic Theory of Matter, explain why the temperature remains constant during the period AB although substance X is absorbing thermal energy.

[2]

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

DANYAL
EDUCATION

DANYAL
EDUCATION

Q5

Fig. 5.1 shows the cooling curve for an unknown liquid, X.

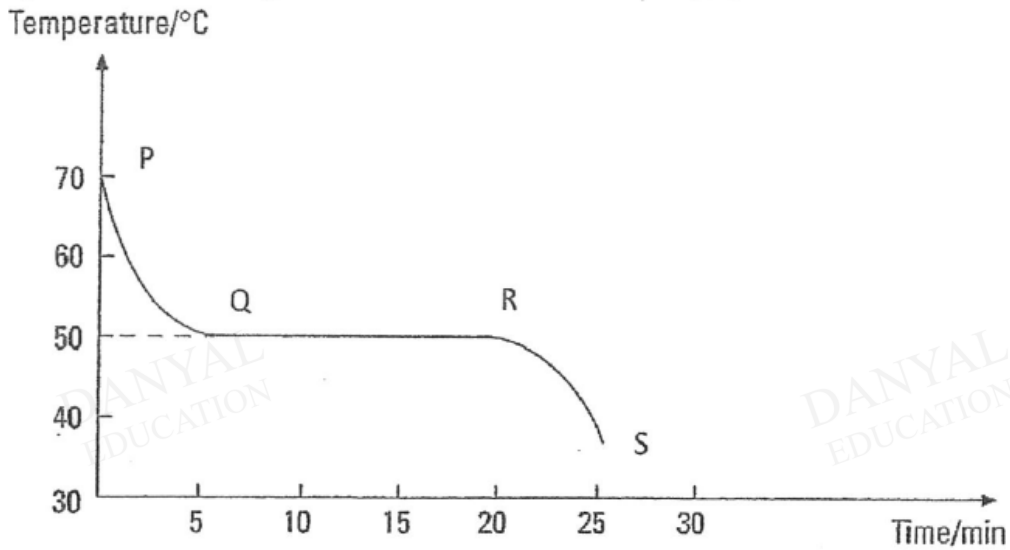


Fig. 5.1

(a) Explain why there is no change in temperature in section QR of the graph.

[2]

(b) Determine the state(s) of X between the following sections of the graph.

(i) PQ : _____

(ii) QR : _____

(iii) RS : _____

[2]

(c) State two differences between boiling and evaporation.

[2]

Answers

Thermal Properties of Matter Test 1.0

Q1

- (i) Evaporation B1
- (ii) Any two of the following answers: B2
- Hotter weather
 - Stronger wind
 - Lower humidity

Q2

- (a) Describe what happens to the molecules in water as its temperature rises. [2]

As the temperature rises, the water molecules gain thermal energy which is converted to kinetic energy, [B1] the average speed of the water molecules increases, molecules will move faster. [B1: 0 marks if the students used "vibrate" or if they only use fast]

Q3

- a 50 °C
- b
1. solid
 2. mixture of solid and liquid
 3. liquid
- c KE does not change, PE increases

Q4

- a) 0
- b) The thermal energy absorbed is used to overcome the intermolecular forces between the molecules [1] for the solid to change to liquid state during the process of melting [1].

Q5

(a) Liquid X is undergoing freezing. Thermal energy is released as molecules come closer to form strong intermolecular forces of attraction. Average kinetic energy of the molecules remain unchanged. [1]
 [1]

(b) [2]
 PQ : Liquid
 QR: Liquid + solid
 RS: Solid
 Any mistake – [1]

(c) Any 2 differences [2]

Boiling	Evaporation
1. Occurs at a fixed temperature	1. Occurs at any temperature
2. Quick process	2. Slow process
3. Takes place throughout the liquid	3. Takes place only at the liquid surface
4. Bubbles are formed in the liquid	4. No bubbles are formed in the liquid
5. Temperature remains constant	5. Temperature may change
6. Thermal energy supplied by an energy source	6. Thermal energy supplied by the surroundings