O Level Combined Physics MCQs

Thermal Transfer Test 1.0

Q1

Electronic components generate a lot of heat when electrical current passes through them. Heat sinks are often attached to these electronic components to dissipate heat to the surroundings so that the electronic components do not get overheated.

Which material, **A**, **B**, **C** or **D**, is the most suitable material to make a heat sink?

material	characteristics
A	black metal with rough surface
B	black metal with smooth surface
C	silver metal with rough surface
D	silver metal with smooth surface

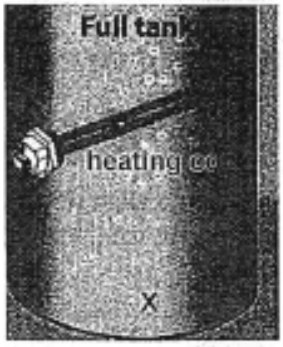
Q2

A metal rod is heated at one end. Which statement best describes the conduction of heat through the metal rod?

(A) Atoms vibrate and hit atoms at the cold end.
(B) Atoms move from the hot end and hit electrons at the cold end.
(C) Free electrons move from the hot end and hit atoms further along the rod.
(D) Free electrons vibrate and pass energy to free electrons further along the rod.

Q3

The following diagram shows a water heating metal coil in a water container.

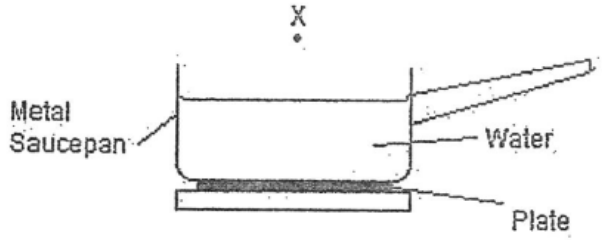


After 10 minutes, the water at position X still remains at room temperature. This is because

A water is a poor conductor of heat.
B the coil is a poor conductor of heat.
C heated water rises in density and rises instead of sinks.
D water is a good reflector of thermal radiation.

Q4

The diagram shows a metal saucepan containing water and placed on a hot plate. After some time, the air at point X also becomes hot.

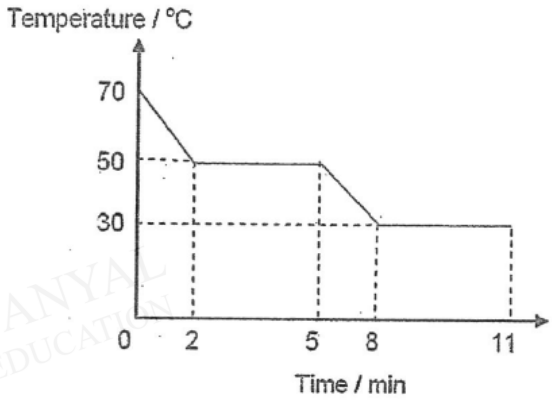


What are the main ways by which heat travels from the hot plate through the base of the metal saucepan, through the water and through the air to point X?

	through the base of the saucepan	through the water	through the air
A	conduction	convection	conduction
B	conduction	radiation	convection
C	convection	convection	radiation
D	conduction	convection	convection

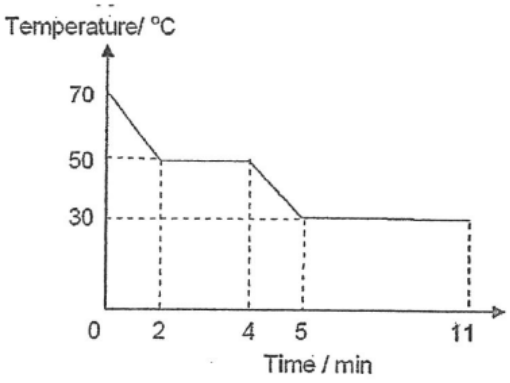
Q5

Roger placed a liquid Q of temperature 70°C in a shiny beaker and plotted a cooling curve as shown in the diagram below.

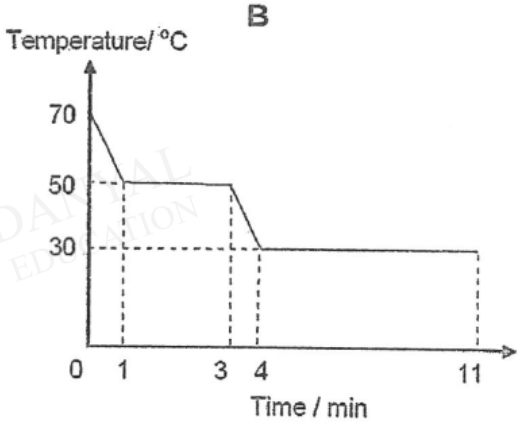


Which of the following cooling curves shows how the liquid Q of temperature 70°C will cool when placed in a dark container?

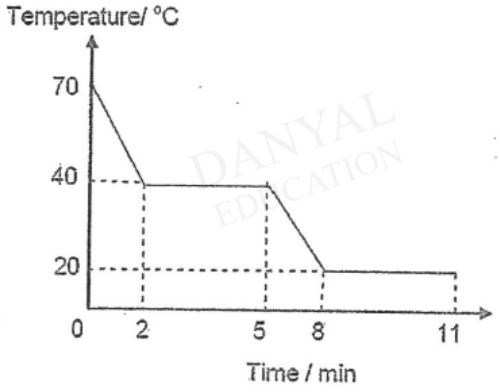
A



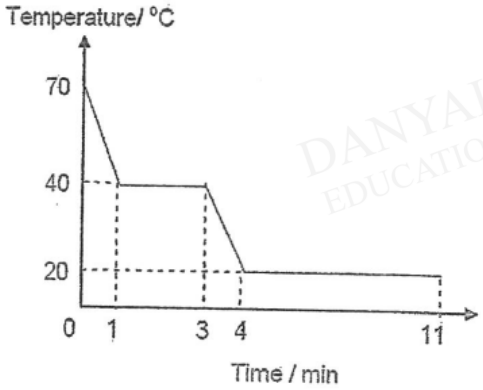
B



C



D



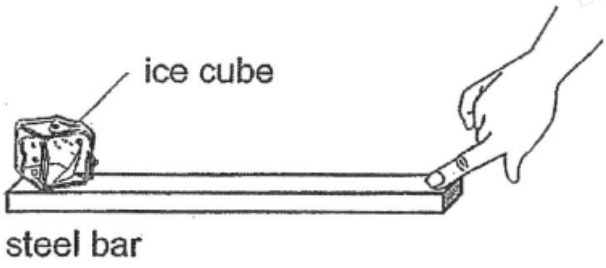
Q6

Which of the following will occur when a gas is heated?

A The particles in the gas will expand and become bigger.
B The distance between particles in the gas will become smaller.
C The particles in the gas will move faster.
D The particles in the gas will stop moving.

Q7

A boy left an ice cube on a steel bar as shown below. After a while he touched the opposite end of the steel bar and found that it was cold.

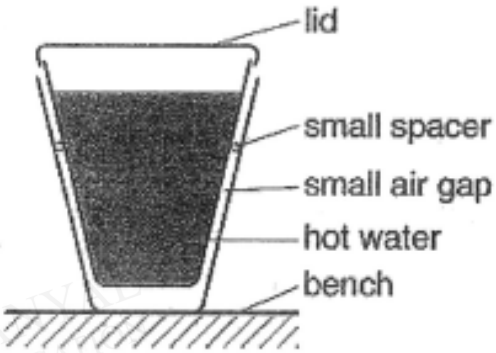


Which of the following statements explains why the steel bar felt cold to his touch?

A The ice cube lost heat to the steel bar, making the bar cold.
B The boy's finger lost coldness to the steel bar.
C The steel bar gained heat from the boy's finger.
D The steel bar lost heat to the boy's finger.

Q8

Two plastic cups are placed one inside the other as shown in the diagram below. Hot water is poured into the inner cup and a lid is put on top as shown.



Which statement is correct?

A Heat loss by radiation is prevented by the small air gap.

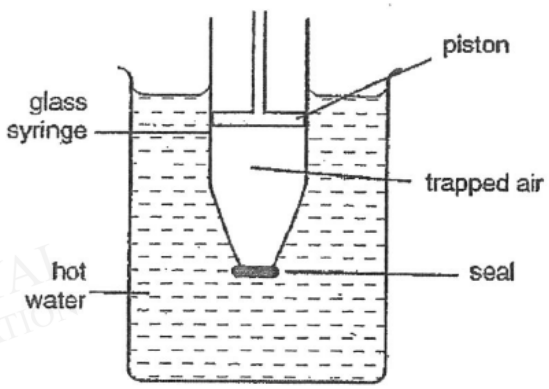
B No heat passes through the sides of either cup.

C The bench is heated by convection from the bottom of the outer cup.

D The lid is used to reduce heat loss by convection.

Q9

The outlet of a glass syringe is sealed so that air is trapped below the piston as shown in the diagram below.



Which of the following explains why the piston begins to rise when the syringe is placed in hot water?

A Convection is occurring inside the syringe.

B The glass is expanding.

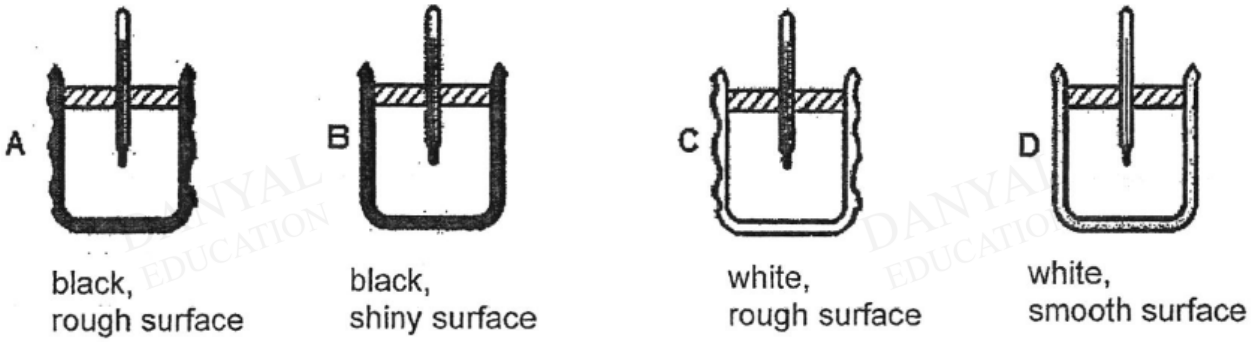
C The molecules of trapped air are getting bigger.

D The trapped air molecules are hitting the piston more often with greater force.

Q10

Four metal cans are identical except for the colour and texture of their outer surfaces. The same amount of tap water is poured into each can.

Which can will give the highest temperature reading after being put in the sun for a period of time?



A: black, rough surface

B: black, shiny surface

C: white, rough surface

D: white, smooth surface

Answers

Thermal Transfer Test 1.0

Q1 A

Q2 D

Q3 A

Q4 D

Q5 B

Q6 C

Q7 C

Q8 D

Q9 D

Q10 A