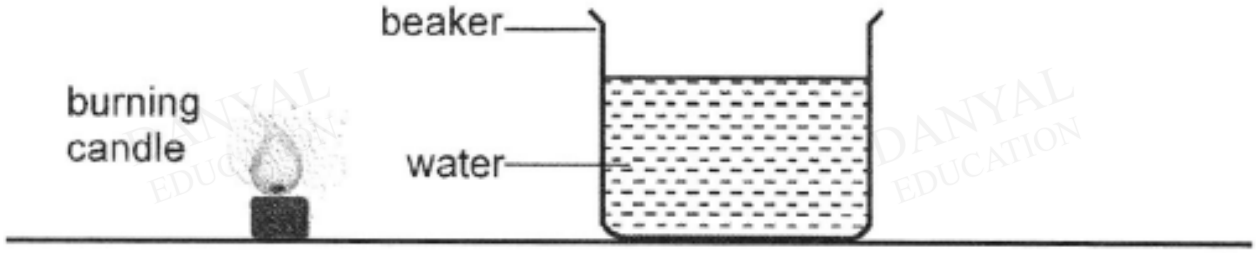
O Level Pure Physics MCQs

Thermal Transfer Test 1.0

Q1

The diagram shows a beaker of water placed near a burning candle.

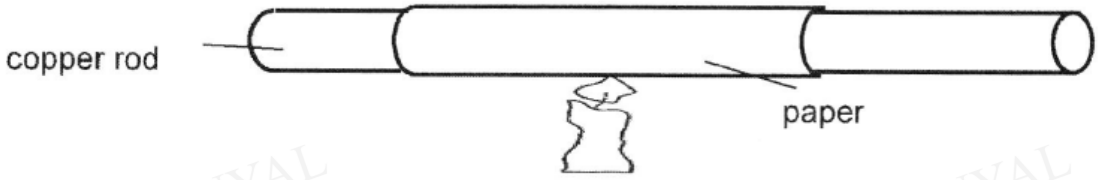


How does thermal energy from the candle reach the water in the beaker?

A conduction → convection
B radiation → conduction
C convection → conduction
D radiation → convection

Q2

Fig. 17.1 shows a piece of paper wrapped tightly around a copper rod and placed above a candle flame. It was observed that the paper did **not** catch fire even when it was placed above the flame for some time.



.Fig. 17.1

Which of the following statements provides the best explanation?

A The flame from the candle is too weak to heat up the paper.
B The copper rod, being a good thermal conductor, conducts heat quickly away.
C The paper is a poor conductor of thermal energy.
D The paper is a poor absorber of radiant heat.

Q3

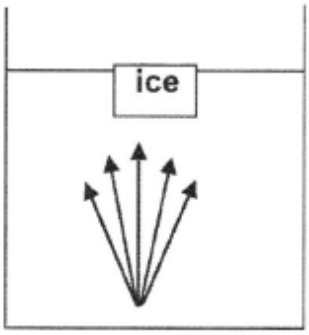
A piece of kitchen aluminium foil is used to wrap around food to be cooked in a barbeque fire. The foil has a shiny and a dull side. Which side should be on the outside and why?

	outside surface	explanation
A	shiny	better heat absorber
B	shiny	better heat conductor
C	dull	better heat absorber
D	dull	better heat conductor

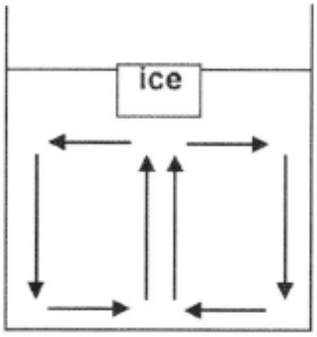
Q4

An ice cube is placed in a beaker of water at the top of the surface. Which figure below best shows the convection currents form in the water?

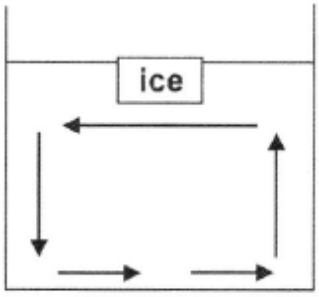
A



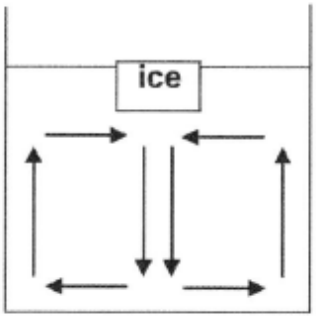
B



C

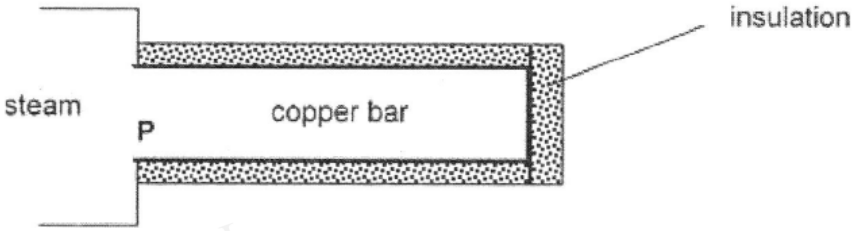


D



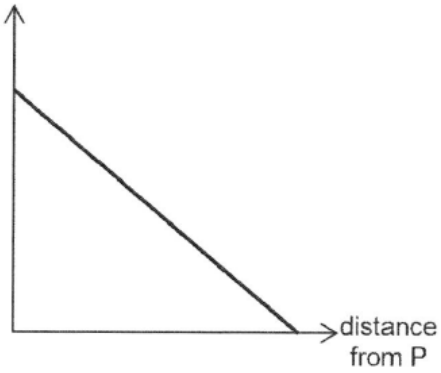
Q5

The diagram shows a cylindrical copper bar with one end, **P**, in contact with a continuous supply of steam. The sides and the other end of the bar are well-insulated as shown in the diagram.



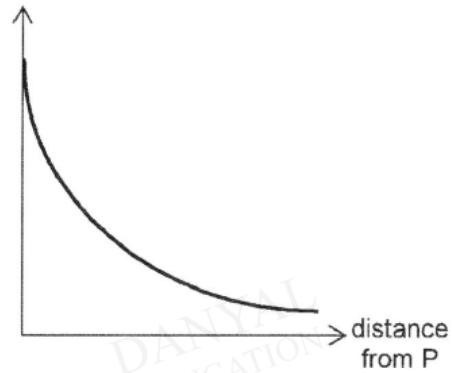
How does the temperature of the bar vary with the distance from point **P** after several hours?

A

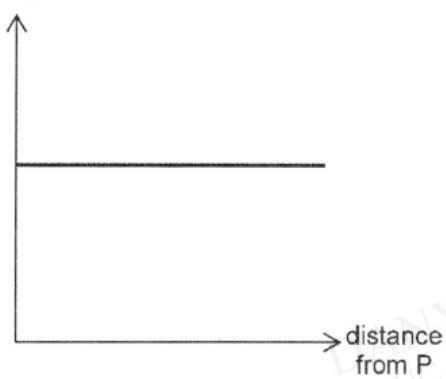


B

C

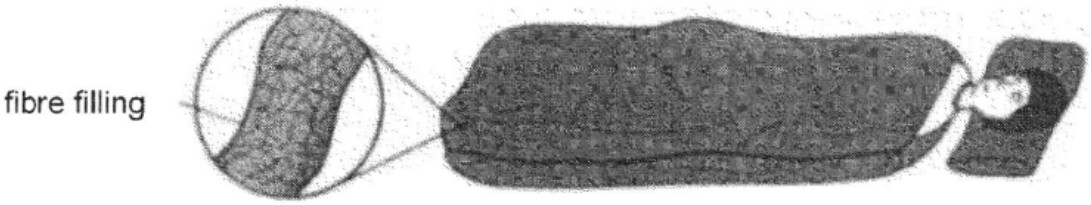


D



Q6

Sleeping bags are designed to keep the user warm when the surrounding temperature decreases. The bags have a fibre filling.



What mode of heat transfer to the surroundings is reduced with the use of the fibre filling and what should be the colour inside the bag?

	mode of heat transfer	colour inside bag
A	conduction	black
B	conduction	white
C	convection	black
D	convection	white

Q7

A cup of water, a metal spoon and a piece of cork are placed in the fridge and are in thermal equilibrium. Which of the following objects has the final lowest temperature?

A cup of water

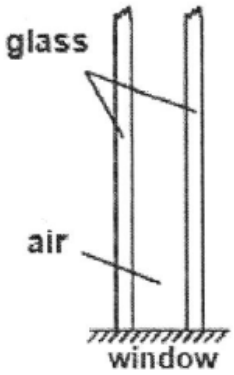
B metal spoon

C piece of cork

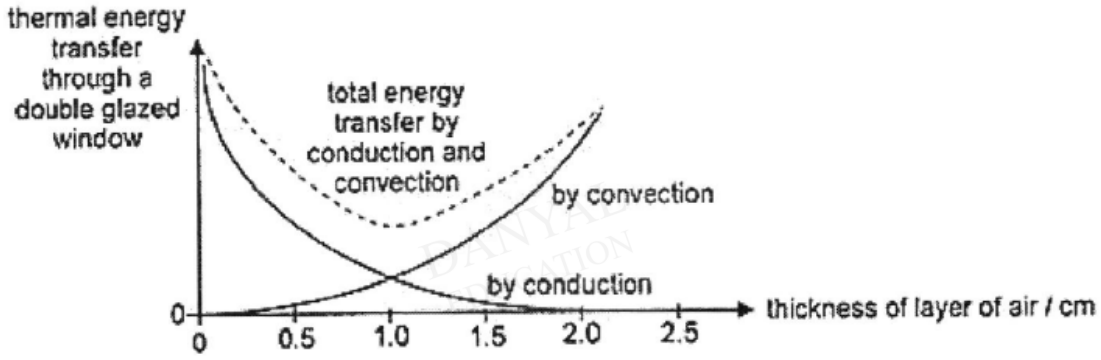
D all three items have the same temperature

Q8

22. A double-glazed window has two sheets of glass separated by a layer of air.



Thermal energy is transferred through the layer of air by conduction and convection. The amount of conduction and convection depends on the thickness layer of air as shown in the graph.



A specially designed room is to be installed with these double-glazed windows. The temperature of this room is kept constant with fluctuations in temperature to be kept to a minimal. What thickness of layer of air of the installed double-glazed windows will best maintain the temperature of the room and why?

A 0.5 cm because there is little convection.
B 1.0 cm because the total thermal energy transfer is minimal.
C 1.5 cm because the total thermal energy transfer is small and conduction is low.
D 2.0 cm because there is little conduction.

Q9

Which statement about copper explains why it is a better conductor of heat than glass?

A Atomic vibration is passed on to neighbouring copper atoms quickly.
B Atoms move through the copper and pass on kinetic energy.
C There are density changes within the copper.
D There are free electrons in the copper.

Q10

A woman stands by a fire to warm her hands and legs.

How does most of the thermal energy reach her hands and legs?

	hands	legs
A	convection	conduction
B	convection	radiation
C	radiation	convection
D	radiation	radiation

Answers

Thermal Transfer Test 1.0

Q1 B

Q2 B

Q3 C

Q4 D

Q5 D

Q6 B

Q7 D

Q8 B

Q9 D

Q10 B