

The City School

North Nazimabad Boys Campus



PHYSICS MONTHLY TEST 2

1ST TERM

Name of Student: _____ Class: _____ Section: _____
Max Marks: 30 Time: 40 minutes Date: _____

Section 'A'

[10]

1. A block of metal has a mass of 2.0 kg. Its specific heat capacity is $800 \text{ J / (kg } ^\circ\text{C)}$. The block is supplied with 2400 J of energy. What is the rise in temperature?

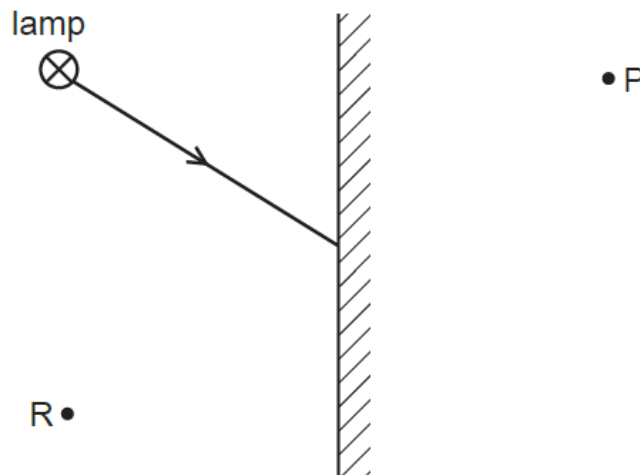
A $0.17 \text{ } ^\circ\text{C}$ B $0.67 \text{ } ^\circ\text{C}$ C $1.5 \text{ } ^\circ\text{C}$ D $6.0 \text{ } ^\circ\text{C}$

2. A quantity of gas is trapped in a container by a piston exerting a force F . The temperature of the gas is raised while F remains unchanged.



Which statement is correct?

- A The gas expands.
B The molecules get larger.
C The piston remains in the same place.
D The speed of the molecules decreases.
3. The diagram shows a ray of light from one point on a lamp striking a plane mirror.



The City School

North Nazimabad Boys Campus

PHYSICS MONTHLY TEST 2

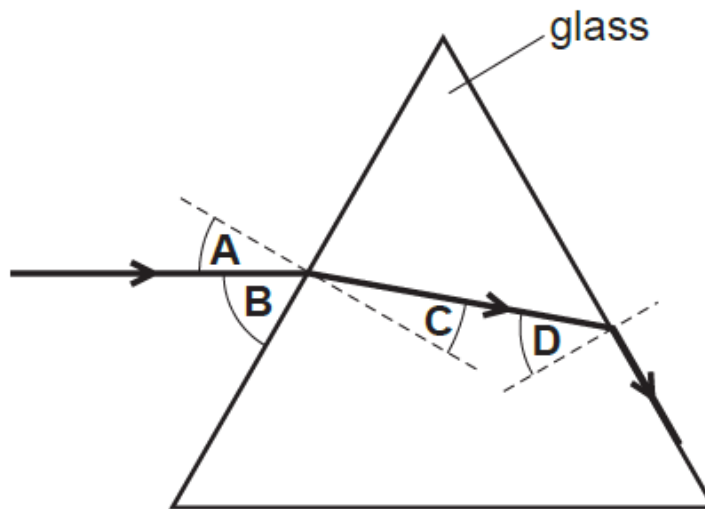
1ST TERM



The image of the point on the lamp formed by the mirror is

- A** at P and is real.
- B** at P and is virtual.
- C** at R and is real.
- D** at R and is virtual.

4. The diagram shows the passage of a ray of light through a triangular glass block. What is the critical angle of light in glass?



5. Fillings in teeth should be made from a material which

- A** expands more than the tooth when heated.
- B** expands by the same amount as the tooth when heated.
- C** expands less than the tooth when heated.
- D** does not expand when heated.

The City School

North Nazimabad Boys Campus

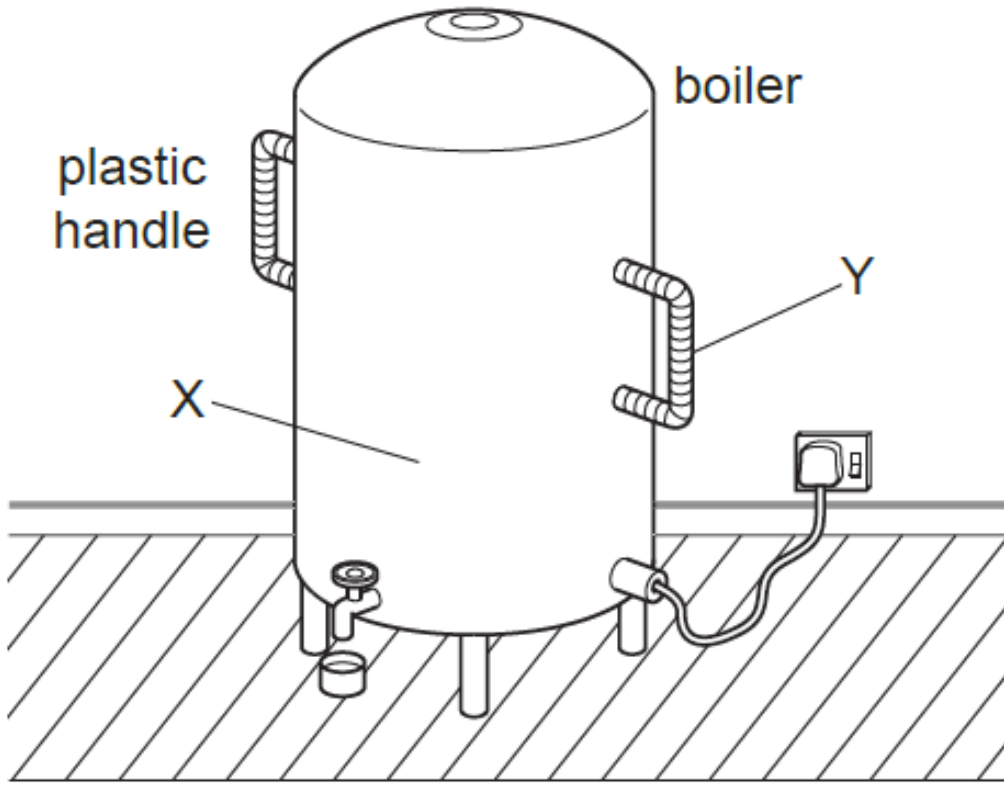
PHYSICS MONTHLY TEST 2

1ST TERM

Section 'B'



1. Fig. shows an electric boiler in a school kitchen.



The boiler contains 35 kg of water at 22 °C. The specific heat capacity of water is 4200 J / (kg °C).

- (a) (i) Calculate the thermal energy (heat) needed to raise the temperature of the water from 22 °C to its boiling point. [3]

- (ii) Write down the reason for the loss of thermal energy from the boiler.

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

- (iii) Suggest one method to limit the loss of energy.

.....
..... [1]

The City School

North Nazimabad Boys Campus



PHYSICS MONTHLY TEST 2

1ST TERM

(b) (i) The immersion heater is placed in the water at the bottom of the boiler. Explain in detail how this ensures that the thermal energy (heat) is transferred throughout the water.

.....
.....
..... [4]

(ii) The boiler is made of steel and has two large plastic handles. When the water is boiling, the steel surface at X is hot while the plastic handle at Y is cool. Explain why.

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

(c) Before the water reaches boiling point, water vapor is seen escaping from the boiler.

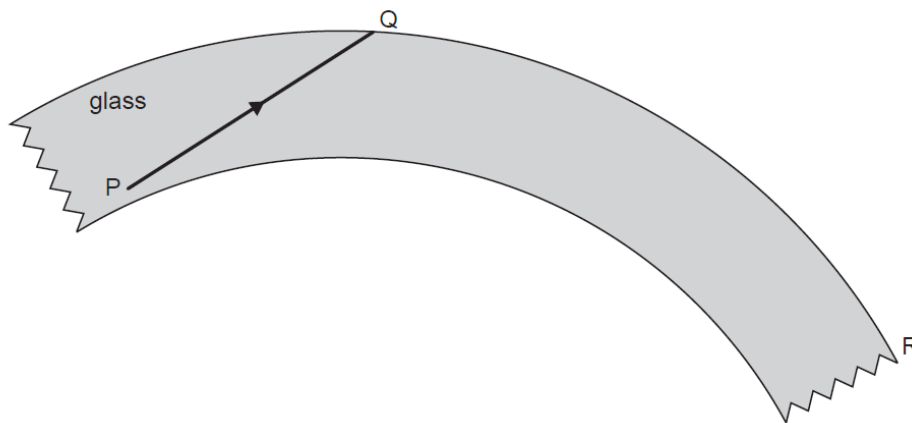
(i) State the name of the process that produces this water vapor.

..... [1]

(ii) State two differences between this process and boiling.

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

2. Fig. shows part of an optical fiber.



The ray PQ undergoes total internal reflection in the optical fiber.

(a) On Fig., continue the path of ray PQ until it reaches end R.

[1]

(b) Explain what is meant by total internal reflection.

.....
..... [1]

The City School

North Nazimabad Boys Campus



PHYSICS MONTHLY TEST 2

1ST TERM

(c) Optical fibers are cheaper and lighter than copper wires. State one other advantage of using optical fibers rather than copper wires for telephone communications.

.....
.....
..... [1]

(d) The light in the optical fiber is travelling at a speed of 2.1×10^8 m / s and has a wavelength of 6.4×10^{-7} m. (Speed= Frequency x Wavelength). Calculate the frequency of the light.

Frequency=..... [2]