

Name of the Student: _____

Max. Marks : 19 Marks

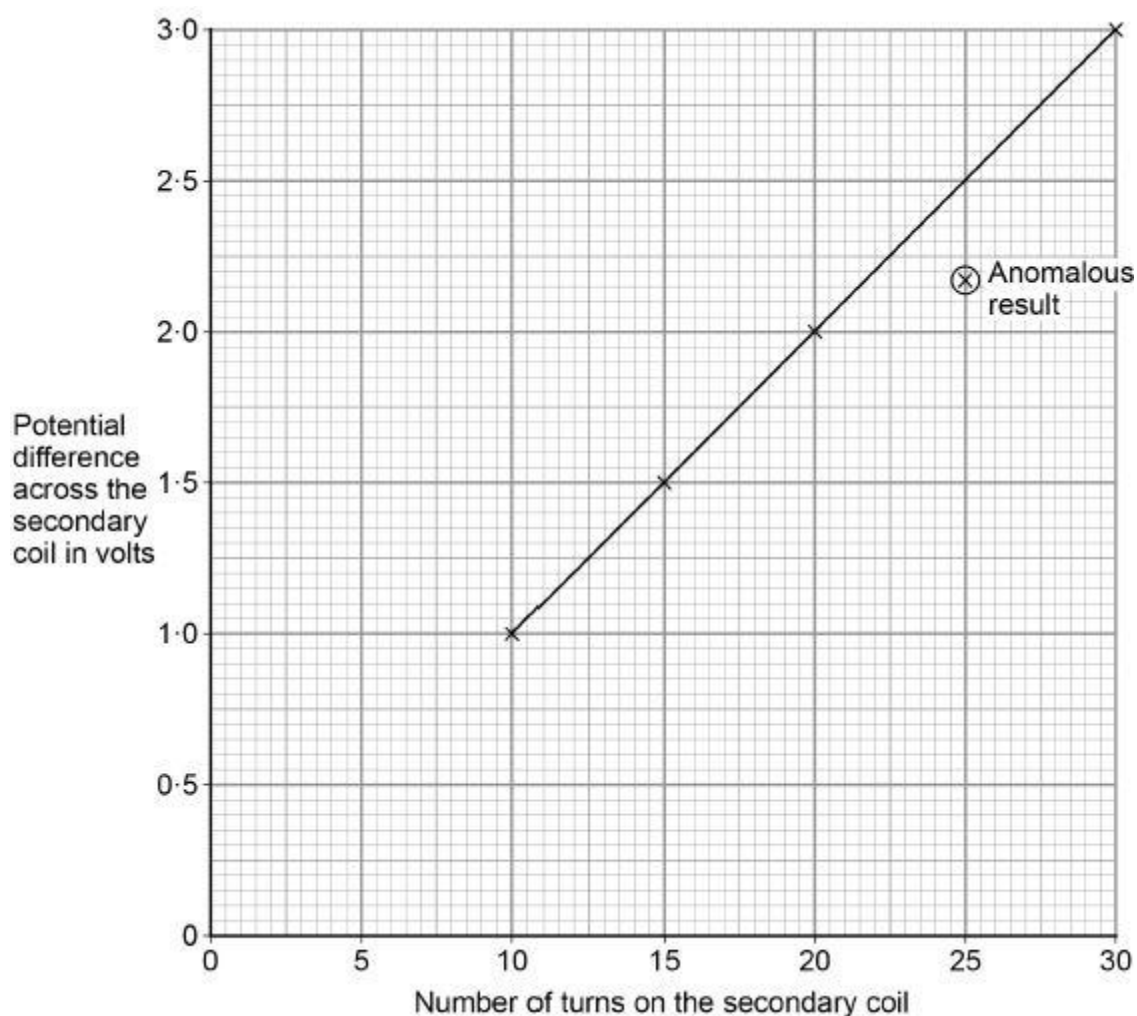
Time : 19 Minutes

Q1.

A student used a simple transformer to investigate how the number of turns on the secondary coil affects the potential difference (p.d.) across the secondary coil.

The student kept the p.d. across the primary coil fixed at 2V.

Figure 1 shows the results collected by the student.

Figure 1

- (a) **Figure 1** contains one anomalous result.

Suggest **one** possible reason why this anomalous result occurred.

(1)

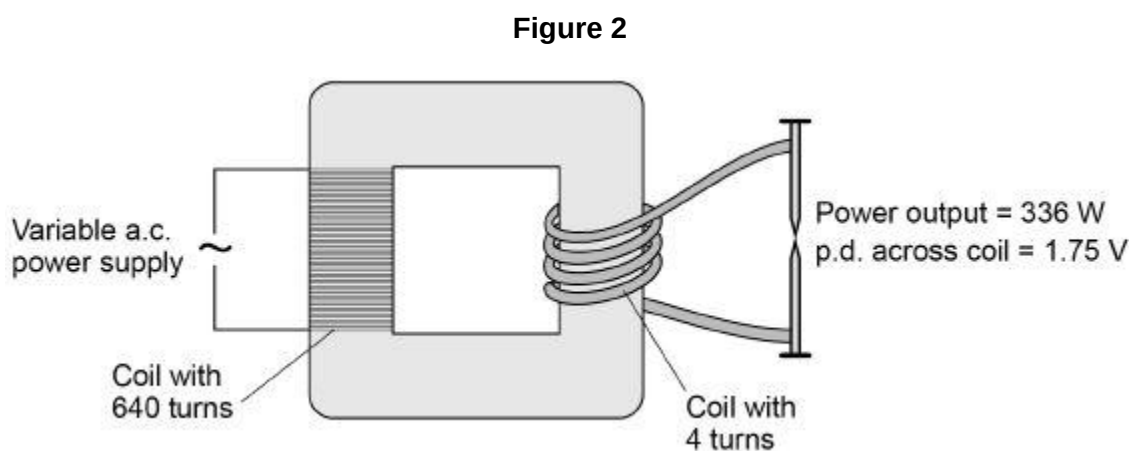
- (b) The transformer changes from being a step-down to a step-up transformer.

How can you tell from **Figure 1** that this happens?

(1)

A spot-welder is a device that uses a transformer to produce a large current to join sheets of metal together.

Figure 2 shows a transformer demonstrating how a large current can heat and join two nails together.



- (c) How does the amount of infrared radiation emitted by the nails change when the power supply is switched on?

(1)

- (d) Calculate the current from the power supply needed to provide a power output of 336 W.

Use the data in **Figure 2**.

The transformer is 100% efficient.

Q2.

Light is usually described as a wave. Light can also be described as a stream of particles.

These are two different scientific models of light.

- (a) Which statement describes a scientific model?

Tick **one** box.

A small scale version of a real object.

☐

A way of guessing what will happen.

☐

An idea used to explain observations and data.

☐

(1)

- (b) Why do scientists sometimes have different models like the wave and particle models of light?

(1)

- (c) Sometimes an old scientific model is replaced by a new model.

Explain why scientists replace an old scientific model with a new model.

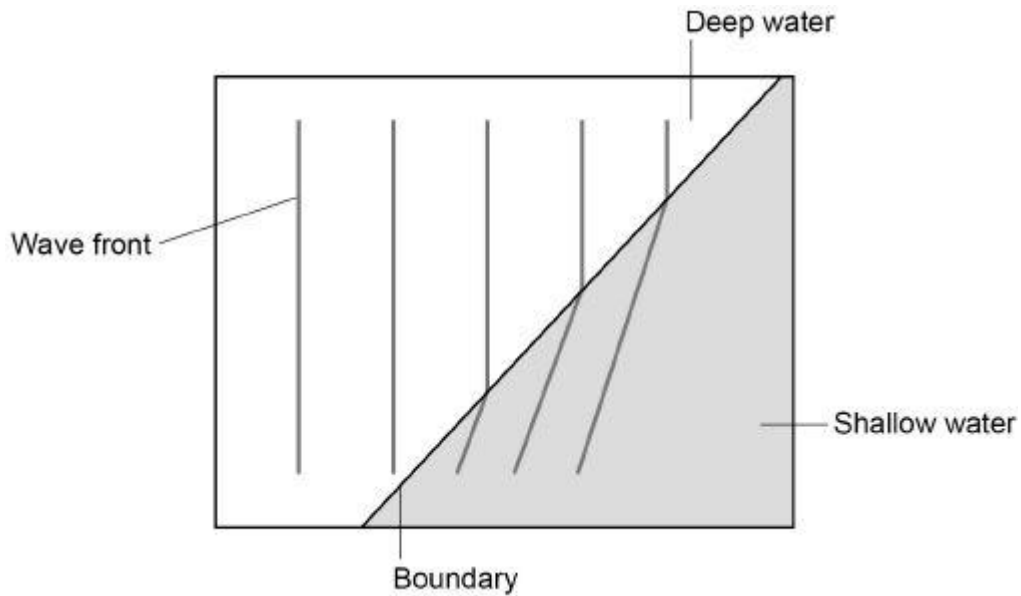
Include an example from Physics in your answer.

(4)

Some students used water waves in a ripple tank to model the behaviour of light waves.

- (d) **Figure 1** shows what happens to the wave fronts as they pass the boundary between deep water and shallower water.

Figure 1

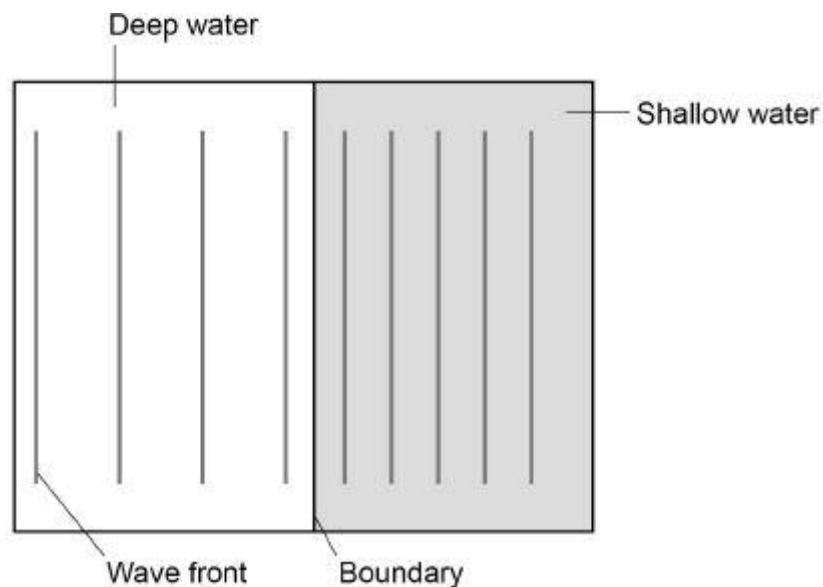


Explain why refraction happens at the boundary between the deep water and shallower water.

(3)

- (e) **Figure 2** shows the wave fronts travelling parallel to the boundary between deep water and shallower water.

Figure 2



Explain why the wave fronts in **Figure 2** do not refract at the boundary.

(2)

(Total 11 marks)