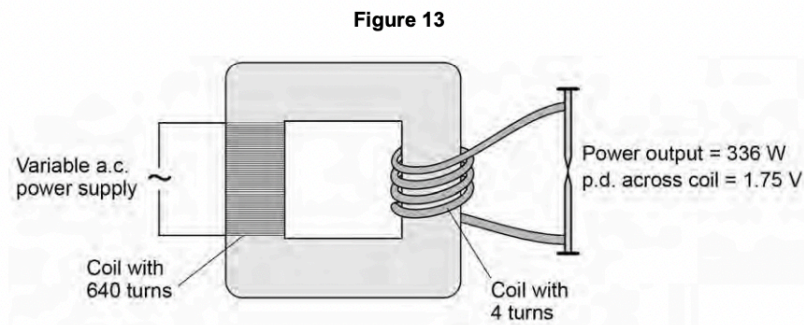


Q1.(2018)

a)

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

Figure 13 shows a transformer demonstrating how a large current can heat and join two nails together.



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

[1 mark]

b)

Calculate the current from the power supply needed to provide a power output of 336 W.

Use the data in **Figure 13**.

The transformer is 100% efficient.

[5 marks]

Current = _____ A

Q2.(2018)

a)

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.

Which statement describes a scientific model?

Tick **one** box.

[1 mark]

A small scale version of a real object.

☐

A way of guessing what will happen.

☐

An idea used to explain observations and data.

☐

b)

Why do scientists sometimes have different models like the wave and particle models of light?

[1 mark]

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 marks]

Q3.(2019)

Explain how the properties of X-rays make them suitable for the medical imaging of bones.

[2 marks]

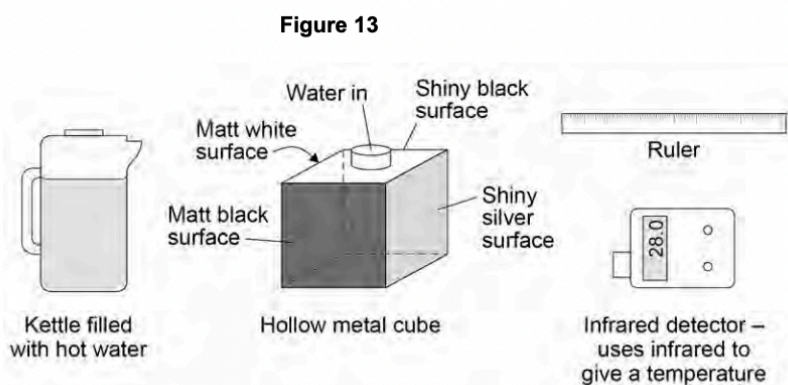
Q4.(2019)

a)

A student investigated the infrared radiation emitted from the sides of a hollow metal cube.

The sides of the cube are different colours or textures.

Figure 13 shows the equipment used.



Boiling water was poured into the cube. The amount of infrared radiation emitted from each vertical surface was then measured.

Boiling water is a hazard in this investigation.

Suggest how the risk of harm could be reduced in this investigation.

[1 mark]

b)

What is the control variable in this investigation?

[1 mark]

c)

Table 2 shows the results.

Table 2

Type of surface	Temperature in °C
Matt black	68.0
Matt white	65.5
Shiny black	66.3
Shiny silver	28.0

The four temperature values in **Table 2** cannot be used to show that the infrared detector gives precise readings.

Give the reason why.

[1 mark]

d)

The student looked at the data in **Table 2** and concluded:

'A black surface always emits more infrared radiation than a white surface.'

Explain how using an infrared detector with a resolution of 1 °C would have affected the student's conclusion.

[2 marks]

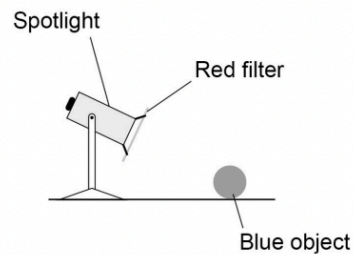
Q5.(2021)

Figure 9 shows a spotlight containing a convex lens.

A red filter is placed in front of the spotlight.

The spotlight is directed at a blue object.

Figure 9



Explain why the blue object appears black.

[3 marks]

Q6.(2021)

Ultraviolet is a type of electromagnetic wave.

Give **one** use of ultraviolet.

[1 mark]

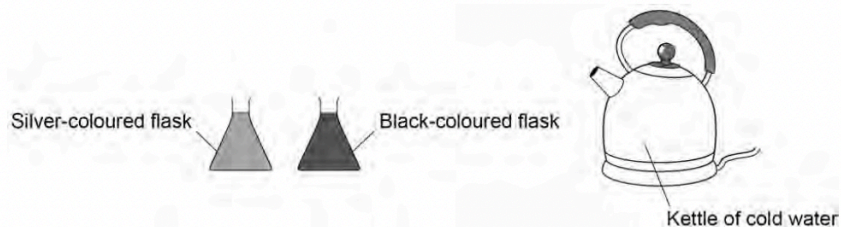
Q7.(2023)

a)

A student investigated how the colour of a surface affects the rate at which the surface emits infrared radiation.

Figure 1 shows some of the equipment used.

Figure 1



The student wrote the following hypothesis:

'The black-coloured flask will emit more infrared radiation than the silver-coloured flask during 10 minutes of cooling.'

Describe a method to test this hypothesis.

[6 marks]

b)

When will the flasks emit infrared radiation at the greatest rate?

Give a reason for your answer.

[2 marks]

Tick (✓) **one** box.

During the 1st minute

☐

During the 5th minute

☐

During the 9th minute

☐

Reason _____

c)

Another student investigated the absorption of infrared radiation by different surface colours.

The student filled four hollow metal cubes with cold water.

Each cube was the same size but had a different surface colour.

The cubes were then placed the same distance from an infrared heater.

After 10 minutes, the student measured the temperature increase of the water inside each cube.

What was the dependent variable in this investigation?

[1 mark]

d)

Table 1 shows the results.

Table 1

Surface colour of the cube	Temperature increase after 10 minutes in °C
Matt white	3.0
Shiny white	2.0
Matt black	6.5
Shiny black	4.0

Give **two** conclusions that can be made from the results in **Table 1**.

[2 marks]

1

2

Q8.(2024)

a)

Radio waves and gamma rays both transfer energy.

Give **three** other similarities between radio waves and gamma rays.

[3 marks]

1 _____

2 _____

3 _____

b)

Both radio waves and gamma rays are used in medicine.

Give **one** medical use of gamma rays.

[1 mark]

c)

Explain why exposure to gamma rays can be harmful but exposure to radio waves is **not** harmful.

[2 marks]

d)

Some medical scanners produce radio waves at a specific frequency.

Explain how radio waves are produced at a specific frequency.

[2 marks]
