

**Eduqas Physics GCSE**  
**Topic 6.5: Black body**  
**radiation**  
**Mark Schemes for**  
**Questions by topic**

1.

Question number	Answer	Mark
8(a)(i)	<p>An explanation that combines identification via a judgement (2 marks) to reach a conclusion via justification/reasoning (2 marks):</p> <ul style="list-style-type: none"><li>• intensity of radiation increases with temperature (1)</li><li>• the distribution of the emitted wavelengths of radiation is affected by temperature (1)</li><li>• at low temperatures the intensity of radiation emitted is low and the (range of) emitted wavelengths (of radiation) are high so the lamp appears dull red (1)</li><li>• at higher temperatures the intensity of the radiation is greater and the (range of) emitted wavelengths (of radiation) are low so the lamp appear to be brighter and less red (1)</li></ul>	(4)

2.

(a) (i) 25 (%)

*do not accept  $\frac{1}{4}$*

1

(ii) increases

1

(b) tick (✓) in top and bottom box

*both required*

1

(c) SHINY surfaces are good reflectors of infra-red radiation

*accept white for shiny*

**or** black surfaces are POOR reflectors of infra-red radiation

*accept bad for poor*

*accept insertion of 'not' before 'good' in statement*

**or** black surfaces are good EMITTERS of infra-red radiation

**or** black surfaces are good ABSORBERS of infra red radiation

1

[4]

3.

(a) to reflect (the infrared)

*accept (shiny surfaces) are good reflectors*

*ignore reference to incorrect type of wave*

1

(b) black

1

best absorber (of infrared)

*answer should be comparative black absorbs (infrared) is insufficient*

*accept good absorber (of infrared)*

*ignore reference to emitter*

*ignore attracts heat ignore reference to conduction*

1

4.

(a) (i) to check rise in temperature (of other thermometers) was due to the (different wavelengths of) light

*accept as a control / comparison*

*to measure room temperature is insufficient*

1

(ii) any **two** from three:

- different colours produce different heating effects / (rises in) temperatures
- red light produces the greatest heating effect / (rise in) temperature

**or**

- violet produces the least heating effect / (rise in) temperature
- all colours produce a greater heating effect than outside the spectrum

*an answer*

*the longer the wavelength the greater the (rise in) temperature*

**or**

*the lower the frequency the greater the (rise in) temperature gains both marks*

2

- (b) move a thermometer into the infrared region / just beyond the red light  
*allow use an infrared camera / infrared sensor*

1

the temperature increases beyond 24(°C)

*accept temperature higher than for the red light*

1

(c)  $v = f \times \lambda$

$9.4 \times 10^{-6}$

*accept  $9.375 \times 10^{-6}$  or  $9.38 \times 10^{-6}$*

**or**

0.0000094

*accept 0.000009375*

*or 0.00000938*

*allow 1 mark for correct substitution*

*ie  $3 \times 10^8 = 3.2 \times 10^{13} \times \lambda$*

2

- (d) at night the surroundings are cooler

*accept at night the air is colder*

*there is no heat from the Sun is insufficient*

**or**

at night there is a greater temperature difference between people and surroundings

1

(so surroundings) emit less infrared (than in daytime)

*accept camera detects a greater contrast*

**or**

gives larger difference in infrared emitted (between people and surroundings)

1

[9]