

Q1. (2018)

05.3	any three from:		3	AO1 6.6.2.3
	<ul style="list-style-type: none"> • (the car aerial) absorbs radio waves or energy • electrons are made to vibrate (in the aerial) • creating an alternating current (in the aerial circuit) • the (signal) frequency is the same (as the radio wave) 			

Q2. (2021)

05.1	different temperatures emit different intensities of infrared		1	AO1
	which are represented (on the infrared camera) as different shades / colours		1	AO3 6.6.2.4
		allow wavelength / frequency / amount for intensity throughout		

Q3. (2021)

05.5	some of the energy of the electrons causes heating		1	AO1
	(therefore) increasing the temperature		1	AO3
	(so using tungsten) allows more electrons to be collided per second than using any other metal	allow (so using tungsten) enables more energy per second to be transferred than using any other metal	1	AO3 6.5.2

Q4. (2022)

a)

05.1	any two pairs from		4	
	<ul style="list-style-type: none">place each flask the same distance from the infrared lampso the intensity of infrared radiation incident on each flask is the same	allow use two lamps at an equal distance from each flask		AO3
				AO1
	<ul style="list-style-type: none">use flasks of the same shape and sizeso the surface area is the same			AO3
				AO1
				6.6.2.2
	<ul style="list-style-type: none">use equal volumes of waterbecause volume of water affects the rate at which the water temperature increases	allow use equal masses of water		
b)				
05.2	7.5	allow 8	1	AO3
	240		1	6.6.2.2
c)				
05.3	(black flask line has) a greater gradient or temperature (of the black flask) increased more (during the same time)		1	AO3 6.6.2.2
d)				
05.4	the flasks absorb infrared radiation and transfer energy to surroundings (by heating and emission of infrared)	allow water for flasks throughout	1	AO3 6.6.2.2
	initially the rate of absorption of infrared is greater than the rate of energy transfer to the surroundings (causing the temperature to increase)		1	
	(rate of) energy transfer to surroundings increases as the temperature of the flasks increase		1	
	eventually the rate of energy transfer to surroundings = rate of energy transfer to flasks (causing the temperature to become constant)		1	

Q5. (2024)

a)

03.6	$4.0 \times 10^{-10} = \frac{1}{\text{frequency}}$		1	AO2 6.6.1.2
	$\text{frequency} = \frac{1}{4.0 \times 10^{-10}}$		1	
	$2.5 \times 10^9 \text{ (Hz)}$	only award if answer is in standard form	1	
b)				
03.7	radio waves are produced (by the transmitter)	allow microwaves are produced (by the transmitter)	1	AO1 6.7.2.1
	the detector absorbs the waves / energy		1	
	(which produces) an alternating current	allow causing electrons to oscillate	1	
	with the same frequency as the (transmitted) waves	allow with the same frequency as the oscillations in the transmitter	1	