Practice Question Set For GCSE
Subject : Physics
Paper-1 Topic : 5_Light and Electromagnetic Spectrum

Name of the Student:_____
Max. Marks : 17 Marks **Time : 17 Minutes**

Mark Schemes
Q1.

	Answer	Acceptable answers	Mark
(a)(i)	Gamma/ γ (wave(s)/ ray(s)/radiation)	X-rays/ radiation	**(1)**
(a)(ii)	Any two from It fluoresces (1) UV (radiation) transfers/gives energy to ink/ink absorbs energy from UV (radiation) (1) (energy from UV is)(re-)radiated/(re)-emitted by ink at lower frequency/as (visible) light (1)	fluorescent Ink/it absorbs UV (light/radiation) Ignore UV is reflected as visible light Ignore luminous emits visible light	**(2)**
(b)	transposition λ = v/f (1) substitution λ = $3 \times 10^8/7 \times 10^9$ (1) evaluation 0.043 (m) (1) Ignore any unit given by candidate	Subst. and transform. either order 1 mark only can be scored for correct substitution after incorrect transposition. $3 \times 10^8/7 \times 10^9$ gains 2 marks Accept any number of sig.figs. that rounds to 0.04 0.04 , 0.0428 (m) (1) Give full marks for correct answer with no working. 0.04 × any other power of 10 = 2 marks	**(3)**

		Indicative Content	Mark
QWC	***c**	A discussion including some of the following points Possible dangerous e-m radiations Microwaves Infrared Ultraviolet (UV)	**(6)**

		X-rays gamma rays Correctly linked to Internal heating of body cells (microwaves) Skin burns (infrared) Damages skin cells/sunburn (UV) Damages eyes (UV) Can cause skin cancer (UV) Can cause cataracts (UV) Damage to cells inside the body(X-rays) Mutate/ kill cells in the body (gamma) Damages DNA (X-rays and gamma rays) Link to frequency As the frequency increases/wavelength decreases (microwave -> gamma) the waves become more penetrating and do more damage/danger as they have more energy.	
Level	**0**	No rewardable content	
1	**1 - 2**	• a limited description e.g. gives at least 2 correct radiations and links both to correct damage OR at least 2 correct radiations named with link to correct damage from one and idea that frequency is linked to damage OR just has link between higher frequency and more damage/dangerous e.g. infrared burns your skin and X-rays can damage cells. OR X-rays have a higher frequency than microwaves and can cause cancer OR Higher frequencies cause more damage to cells. • the answer communicates ideas using simple language and uses limited scientific terminology • spelling, punctuation and grammar are used with limited accuracy	
2	**3 - 4**	• a simple description e.g. gives most of the correct radiations and links to correct	

		damage, at least one with detail of the damage that is caused OR links two to detail of the damage, AND has a link between frequency and energy/danger e.g. Microwaves are absorbed by water in body cells. UV can cause skin cancer and damages your eyes. Xrays and gamma rays can damage cells inside your body OR Gamma and X-rays can penetrate deep into the body. Gamma does most damage as it has the highest frequency. • the answer communicates ideas showing some evidence of clarity and organisation and uses scientific terminology appropriately • spelling, punctuation and grammar are used with some accuracy
3	**5 - 6**	• a detailed description e.g. gives most of the correct radiations with links to detail of the damage AND explains the link between frequency and energy/danger. e.g Microwaves heat up the water in cells. UV can cause cataracts. Gamma rays are the most penetrating and can mutate cells inside the body because they have the highest frequency. • The answer communicates ideas clearly and coherently uses a range of scientific terminology accurately • spelling, punctuation and grammar are used with few errors

Q2.

Question number	Answer	Additional guidance	Mark
	an explanation to include two from: waves cannot be seen (on arrival) (1) person will need another way of detecting the waves (1) (as) a person cannot count to 12 in one second / at a rate of 12 per second (1) <u>frequency</u> too high (1)	idea of coming too fast to count / easy to lose count	**(2)**

Q3.

Question Number	Answer	Additional guidance	Mark
	substitution (1) $\frac{3.0 (\times 10^{8})}{5.8 (\times 10^{-7})}$ evaluation (1) 5.2×10^{14} unit (1) Hz	 answers that round to 5.2×10^{14} award 2 marks for a correct answer without working allow 1 mark for answers that round to 5.2 to any power of ten independent mark accept hz or s^{-1} or per sec(ond) or hertz accept kHz, MHz etc with correct power (10^{11} kHz, 10^{8} MHz)	**(3)** AO 2 1