Practice Question Set For GCSE
Subject : Physics
Paper-1 Topic : 5_ Light And Electromagnetic Spectrum

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Name of the Student:_____
Max. Marks : 22 Marks **Time : 22 Minutes**

Mark Schemes

Q1.

	Answer	**Acceptable answers**	**Mark**
	Any one from black is a good thermal radiator (1) (helps to) prevent motors overheating (1)	(good) emitter (helps to) remove wasted energy/ heat (from the motor)	**(1)**

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Q2.

	Answer	Acceptable answers	Mark
(a)	18 (°C) (1) Ignore any unit given by candidate.		**(1)**
(b)(i)	(black is the) best absorber (of radiation/heat)(compared to other colours) (1)	(Black/it) absorbs more (Black/it) is a good absorber (of radiation/heat) (black is) good at taking in (radiation/heat) Ignore (black is a) good emitter Ignore light. Reject black attracts heat/radiation	**(1)**
(b)(ii)	• Heating effect/temperature greatest at/beyond red (1) • (There is) radiation beyond red (end of spectrum)(1)	(idea of) different colours have different heating effects (Radiation from) sunlight causes a heating effect accept reverse argument Infrared/IR (beyond red end of spectrum)	**(2)**
(b)(iii)	Any **one** from • To check the thermometers produce the same readings/ temperature (under the same conditions) (1) • To show that temperature changes.	(To check) they were all at the same temperature (before starting the experiment.) To be able to make a comparison (between shade and light) (To allow them to carry out a) fair test	**(1)**
(c)(i)	C damage to the eyes (1)		**(3)**
(c)(ii)	D all three signals arrive at the same time (1)		**(1)**
(c)iii	Description linking **one** of the following pairs: • security marking (1) • ink absorbs UV and re-radiates (visible) light (1) • fluorescent lamps (1) • coating absorbs UV and	invisible ink/smart water glows under UV (outside of) lamp glows when hit by UV forgeries/fake bank notes/passports/fingerprints/ body fluids etc markings glow under UV tanning beds tans the skin /the body e.g. disco lighting (1) makes	**(2)**

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	reradiates (visible) light (1) • genuine bank notes (1) • watermark absorbs UV and reradiates (visible) light (1) • disinfecting water (1) • UV kills bacteria (1) • sun beds (1) • UV absorbed by (melanin in) skin (1) Any suitable use gains 1 mark Any suitable use + detail gains 2 marks	clothing glow (1)	

(Total for question = 9 marks)

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Q3.

Question Number	Answer	Acceptable answers	Mark
(a)	**C** total internal reflection		**(1)**

Question Number	Answer	Acceptable answers	Mark
(b)	drawn ray changing direction at the boundary as it goes into the glass (1) towards the normal after entering the glass (1)	line should be near to straight allow dotted lines / don't need arrows ignore lines outside the glass block **reject** lines in the block going to the left of the normal.	**(2)**

Question Number	Answer	Acceptable answers	Mark
(c) (i)	each point plotted to within half a small square.	i.e. first plotted point to lie within 22→24, second 30→32 must be plotted; can't assume under any line they draw	**(2)**

Question Number	Answer	Acceptable answers	Mark
(c)(ii)	one best fit **curved** line close to / through most of points	**the best fit line does not have to extend beyond the plotted points.** reject very shaky / point to point drawing and tramlining (multiple lines). Reject lines forced through the origin involving kinks / changing directions in order to do so.	**(1)**

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Question Number		Indicative Content	Mark
QWC	**(c)(iii)**	An explanation including some of the following ideas :- • idea(s) of refraction / reflection / TIR conveyed • as angle of incidence increases so angle of refraction increases • becomes increasingly steep/ gradient increases (non-linear) • because of refraction (light speeding up) • at 42° light stops refracting / up to 42° limit idea • critical angle case described in terms of an emerging ray along the boundary (or similar) • beyond 42° reflection occurs • this is total internal reflection • then angle of incidence = angle of reflection (in the glass)	**(6)**
Level	**0**	No rewardable content	
1	**1 - 2**	• a limited explanation including isolated facts e.g. about light bending / refraction • 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 explanation linking facts about a part of the process e.g. as angle of incidence increases so angle of refraction increases • 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 explanation which links ideas about more than one part of the whole process e.g. an accurate explanation of refraction before 42° and TIR after 42° • the answer communicates ideas clearly and coherently uses a range of scientific terminology accurately • spelling, punctuation and grammar are used with few errors	

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