Practice Question Set For GCSE
Subject : Physics
Paper-1 Topic : Waves

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Name of the Student:_____
Max. Marks : 24 Marks **Time : 24 Minutes**

Mark Schemes

Q1.

	Answer	**Acceptable answers**	**Mark**
(a)	A		**(1)**
(b)	alpha particles (In the left section) gamma rays (centre section) infrared radiation (right section) (2)	Any one in correct position for one mark, all three in correct position for two marks	**(2)**
(c)	C		**(1)**
(d)	A description to include The purpose of using gamma radiation (1) Some relevant detail about how it achieves the purpose (1)	Purposes may include sterilising food /medical equipment detection / treatment of cancer imaging /detect flaws in materials	**(2)**

		Indicative Content	**Mark**
QWC	***(e)**	An explanation including some of the following points Results obtained: • Herschel: temperature on thermometer • Ritter: speed of darkening of silver chloride paper Trend of results: • Herschel: hotter towards red end • Ritter: quicker towards blue/violet end Extension of experiment to get more results: • Herschel:	**(6)**

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		measure below red; found it even hotter • Ritter: measure above blue/violet; paper darkened quicker Conclusion: • Herschel: Must be radiation below red (Infra Red) • Ritter: Must be radiation above blue/violet (UV)	
Level	**0**	No rewardable content	
1	**1 - 2**	• A limited description of either some results or conclusions from either experiment. For example: They measured temperature across the spectrum and found that temperature changed. They put silver chloride paper in the spectrum and found that it darkened at different speeds with different colours. 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 of results and conclusions from both experiments . For example: Herschel measured the temperature across the spectrum and found it hotter towards the red end. This was infra red radiation. Ritter measured the darkening of chloride paper across the spectrum. It was quicker towards the violet end. They had discovered ultra violet. • 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 of all the results obtained from both experiments and the conclusions from these results. For example a response as for level 2 given above but with detail about results being obtained from outside the visible spectrum • 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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Q2.

Question number	Answer	Additional guidance	Mark
i	An explanation linking: frequency (1) in mouse hearing range but not in human hearing range (1)	 accept wavelength relevant frequency value with unit eg>20 kHz	**(2)** **AO2**

Question number	Answer	Additional guidance	Mark
ii	A description to include: send pulse to a wall/reflecting surface OR detect the echo (1) measure distance (to wall and time to echo) (1) use speed = 2 x $\frac{\text{distance}}{\text{time}}$ (1)	 accept measure time to receive echo OR reflection back OR record time to echo/return	**(3)** **AO3**

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Q3.

	Answer	Acceptable answers	Mark
(i)	☒ **A** ultrasound waves have a frequency above 20 000 Hz		**(1)**
(ii)	☒ **C** sonar		**(1)**
(iii)	a description including any **two** of the following: • (ultrasound waves / pulses) go down (through the water) (1) • (ultrasound waves are) reflected **off fish** (1) • (reflected ultrasound waves) are received by boat (1) • time delay (shows how deep fish are) (1)	on diagram, wave or ray indicated as downwards idea of wave moving towards or hitting fish on diagram, waves or rays reflected **off fish** idea of wave bouncing **off fish** signal is timed **ignore** fish emitting ultrasound	**(2)**

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Q4.

Question Number	Answer	Additional guidance	Mark
	using cold row: evaluate (K=)376 (1) using warm row: substitute K and ρ $\frac{376}{\sqrt{1.16}}$ OR 349.10.... (1) 349 (m/s) to 3 sig figs (1)	 $\frac{\text{other K from earlier calculation}}{\sqrt{1.16}}$ any answer to 3 sig figs 349.10... scores MP1 and MP2 award full marks for the correct answer without working	**(3)**

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