Practice Question Set For GCSE
Subject : Physics
Paper-2 Topic : 13_Electromagnetic Induction

Name of the Student:_____
Max. Marks : 19 Marks **Time : 19 Minutes**

Mark Schemes

Q1.

Question number	Indicative content	Mark
*	Answers will be credited according to candidate's deployment of knowledge and understanding of the material in relation to the qualities and skills outlined in the generic mark scheme. The indicative content below is not prescriptive and candidates are not required to include all the material which is indicated as relevant. Additional content included in the response must be scientific and relevant. Basic facts • Sound is vibrations (of air) • Loudspeaker emits / gives out sound • Loudspeaker is an output device • Microphone accepts / takes in sound • Microphone is an input device Principles of operation • Alternating current or (electrical) signal sent into a loudspeaker • Loudspeaker cone / coil vibrates (air) • Motor effect in loudspeaker • Microphone cone / coil is vibrated by air/sound • Alternating current / (electrical) signal is produced by microphone • Electromagnetic induction in microphone	**(6)** **AO2**

Downloaded from www.merit-minds.com

	Details of operation of loudspeaker • Alternating current or (electrical) signal in coil produces changing magnetic field • (changing) Force between magnetic field of coil and magnet. • Frequency / amplitude of sound depends on frequency / amplitude of alternating current Details of operation of microphone • Coil oscillates in a magnetic field • Generates an alternating p.d. (across the wires) / alternating current /signal • Frequency / amplitude of alternating p.d. / current depends on amplitude / frequency of the sound	

Level	Mark	Descriptor
	0	• No awardable content
Level 1	1-2	• The explanation attempts to link and apply knowledge and understanding of scientific ideas, flawed or simplistic connections made between elements in the context of the question. • Lines of reasoning are unsupported or unclear. (AO2)
Level 2	3-4	• The explanation is mostly supported through linkage and application of knowledge and understanding of scientific ideas, some logical connections made between elements in the context of the question. • Lines of reasoning mostly supported through the application of relevant evidence. (AO2)
Level 3	5-6	• The explanation is supported throughout by linkage and application of knowledge and understanding of scientific ideas, logical connections made between elements in the context of the question. • Lines of reasoning are supported by sustained application of relevant evidence. (AO2)

Downloaded from www.merit-minds.com

Level	Mark	Additional Guidance	General additional guidance – the decision within levels e.g. - At each level, as well as content, the scientific coherency of what is stated will help place the answer at the top, or the bottom, of that level.
	0	No rewardable material.	
Level 1	1–2	Additional guidance Basic facts	Possible candidate responses A loudspeaker vibrates to make sound.
Level 2	3–4	Additional guidance Principles of operation supported by basic facts. Facts may be implied by principles.	Possible candidate responses Sound vibrates the coil in the microphone. This makes a signal. OR A loudspeaker uses the motor effect to vibrate the cone and make a sound.
Level 3	5–6	Additional guidance Principles and details of operation. Principles may be implied by details. One device may be more developed than the other but both devices must be referenced.	Possible candidate responses Alternating current in the loudspeaker coil makes the coil move inside the magnet. This forces the cone to vibrate and produce sound. The microphone makes an alternating current.

Downloaded from www.merit-minds.com

Q2.

Question number	Answer	Mark
	D a microphone	**(1)**

Downloaded from www.merit-minds.com

Q3.

Question number	Answer	Mark
	B keep the magnet still and move the coil to the left	**(1)**

Downloaded from www.merit-minds.com

Q4.

Question Number	Answer	Additional guidance	Mark
(i)	A description that makes reference to an alternating /changing current (1) in the primary coil (1)	ignore references to voltage / potential difference AC accept switch on or off	(2)

Question Number	Answer	Additional guidance	Mark
(ii)	substitution into $\frac{Vp}{Np} = \frac{Vs}{Ns}$ (1) $\frac{230}{2000} = \frac{15}{Ns}$ rearrangement (1) $(N_S =) \frac{2000 \times 15}{230}$ evaluation (1) 130 (turns)	rearrangement and substitution can be in either order $\frac{230}{15} = \frac{2000}{Ns}$ using $\frac{Vp}{Vs} = \frac{Np}{Ns}$ accept answers that round to 130 or 131 (arising from rounding of intermediate evaluations) award full marks for the correct answer without working	(3)

Downloaded from www.merit-minds.com

Q5.

	Answer	Acceptable answers	Mark
(i)	Substitution (1) 1.5 × 6 Evaluation (1) 9 (W) Ignore any unit given by candidate.	Power of 10 error max 1 mark Give full marks for correct answer with no working shown	**(2)**
(ii)	• More turns on the coil (1) • More powerful/stronger magnet(s) (1)	Wrap coils on iron (core/former)/ more coils/twists/loops. Bigger coil is insufficient. More magnets. Bigger/larger magnet is insufficient. Ignore increase speed of rotation	**(2)**
(iii)	A description including • in one direction only for DC (1) • reversing direction for AC (1)	'DC goes straight' is insufficient AC switches/changes direction OR moves to and fro 'AC goes different ways' is insufficient. Diagram with labelled arrows could get 2 marks.	**(2)**

Downloaded from www.merit-minds.com