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

Name of the Student:_____
Max. Marks : 20 Marks **Time : 20 Minutes**

Mark Schemes

Q1.

Question Number	Answer	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. AO1(6 marks) Understanding of physics • (long) transmission wires have resistance • reduced p.d. at the destination • (thermal) energy is dissipated in the transmission wires • this creates a power loss (refers to $P=I^2R$) • transformers are used to step up to a high voltage for transmission • this means a low current (refers to $V_PI_P=V_SI_S$) • so power loss is small(er) • transformers used to step down to a safer voltage for consumers • consumer wires are shorter and so power loss is less of an issue	**(6)** AO 1 1

Level	Mark	Descriptor
	0	• No rewardable material.
Level 1	1-2	• An explanation that demonstrates elements of physics understanding, some of which is inaccurate. Understanding of scientific, enquiry, techniques and procedures lacks detail. (AO1) • Presents an explanation that is not logically ordered and with significant gaps. (AO1)
Level 2	3-4	• An explanation that demonstrates physics understanding, which is mostly relevant but may include some inaccuracies. Understanding of scientific ideas, enquiry, techniques and procedures is not fully detailed and/or developed. (AO1) • Presents an explanation of the procedure that has a structure which is mostly clear, coherent and logical with minor steps missing. (AO1)
Level 3	5-6	• An explanation that demonstrates accurate and relevant physics understanding throughout. Understanding of the scientific ideas, enquiry, techniques and procedures is detailed and fully developed. (AO1) • Presents an explanation that has a well-developed structure which is clear, coherent and logical. (AO1)

Q2.

Question Number	Answer	Acceptable answers	Mark
(a)	An explanation linking two from MP1 (so that they) decrease the (high) voltages (1) MP2 high voltages used for efficiency/energy saving (1) MP3 (step-down transformers) used {near / for} {homes / factories/appliances} (1) MP4 (so that it is) safer (1)	**stepping down voltage reducing from {high/eg 200 000 V} to {low /e.g.230 V} voltage** **low current used for efficiency/ energy saving** less risk of electrocution high voltages are dangerous	**(2)**

Question Number	Answer	Acceptable answers	Mark
(b)	one line / curve above **and** below x-axis (1) two complete cycles in the 1.0 s (1)	one complete cycle in 0.5 s	**(2)**

Question Number	Answer	Acceptable answers	Mark
(c)	Transposition (1) $V_s = V_p \times n_s/n_p$ Substitution (1) $(V_s =) \frac{12 \times 100}{2400}$ Evaluation (1) 0.5 (V)	Substitution and transposition in either order i.e. if $\frac{12 \times 100}{2400}$ is seen this scores 2 If they sub Vp, Np and Ns correctly, ignore anything for Vs even a blank Calculation may be done using turns ratio Correct answer no working = full marks answer (no working) with POT error =2 (eg 5 or 0.05) Ignore powers of 10 until evaluation	**(3)**

Question Number	Answer	Acceptable answers	**Mark**
(d)	C		**(1)**

Q3.

Question number	Answer	Additional guidance	Mark
(i)	An explanation that combines identification via a judgment to reach a conclusion, via reasoning to include • the peaks get higher (1) • because (faster means) greater rate of change of magnetic field (1) • the width of the peaks gets less (1) • because (faster means) shorter times for magnet to travel through (coils) (1)	greater induced emf / voltage width of each wave gets less	(4)

Question number	Answer	Additional guidance	Mark
(ii)	An explanation that combines identification, via a judgment, to reach a conclusion, via reasoning, linking one from: • time involved is very short (1) • 500 ms (0.5 s) shown on graph (1) with one from • the meter could not respond quickly enough (1) • human/person could not take/record the readings quickly enough (1)	data loggers can take (lots of) readings quickly human reaction times insufficient	(2)