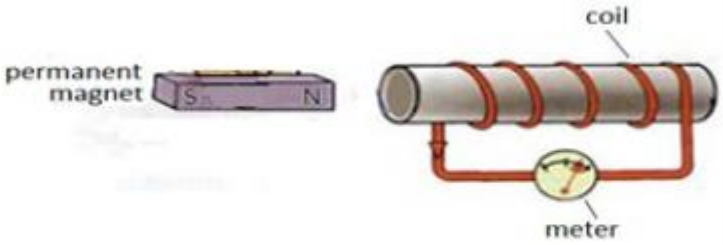
Practice Question Set For GCSE
Subject : Physics
Paper-2 Topic : 13_Electromagnetic Induction

Name of the Student:_____
Max. Marks : 27 Marks **Time : 27 Minutes**

Mark Schemes

Q1.

Question Number	Answer	Additional guidance	Mark
(i)	a diagram that has the meter connected across the ends of a coil and a magnet orientated parallel to the axis of the coil; for example 	poles need not be labelled	(1)

Question Number	Answer	Additional guidance	Mark
(ii)	An explanation linking move magnet towards coil and then away from coil (1) with note change in 'direction' of **meter** (1) move magnet quickly then slowly (1) with larger / smaller **meter** reading (1)	 change poles of magnet allow use of ± in digital meters change speed of movement of magnet or changes to the number of turns ignore changes to size/strength of magnet	**(4)**

Q2.

Question Number	Answer	Acceptable answers	Mark
(a)(i)	D the spring has more elastic potential energy than the weight has kinetic energy		**(1)**

Question Number	Answer	Acceptable answers	Mark
(a)(ii)	A description including three from MP1 Elastic potential energy /EPE (in stretched spring) (1) MP2 (EPE is) transferred to KE (initially) (1) MP3 change from KE to GPE or vice versa(1) MP4 (correct idea of) energy changes continuing MP5 {total mechanical energy /kinetic +potential energy} decreases (continuously) (1) MP6 (Eventually all is transferred to) {thermal/heat} (energy) (1)	care should be taken not to award marks for contradictory examples Starting point for description does not matter Ignore sound energy EPE becomes/goes to KE (initially) condone amplitude decreases to zero KE or PE 'lost' to surroundings	**(3)**

Question Number	Answer	Acceptable answers	Mark
(b)(i)	B increase the efficiency of the motorcycle		**(1)**

Question Number	Answer	Acceptable answers	Mark
(b)(ii)	MP1 (bump produces) relative motion (1) MP2 (motion between magnet and coil) {induces / generates} voltage (1)	coil moves round magnet/magnet moves {into/out of} coil / coil {cuts / moves across} magnetic field ignore magnets slide inside a coil (see stem) electromagnetic induction condone {induces / generates } {current/electricity} ignore (see stem) electrical energy provides / produces	**(2)**

Question Number	Answer	Acceptable answers	Mark
(b)(iii)	An explanation linking MP1 {more/frequent} bumps (1) (idea of shorter time / increased frequency) MP2 (bigger bumps produce) bigger amplitude / move more up and down (idea of bigger size) (1) MP3 (so) {induced voltage /voltage generated} is larger (1)	 idea of up and down for bump (coil / magnets) move up and down {faster / more often} (coil/magnets) move {further/higher/bigger distance} (up and down) {induced current/current generated} is larger electromagnetic induction gives more voltage/current condone more electricity/electrical energy is {induced / generated} allow once for MP1 (if MP1 or MP2 is not scored): 'bumpier' 'go in and out more'	**(3)**

Q3.

	Answer	Acceptable answers	Mark
(ai)	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)**
(aii)	• 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)**
(aiii)	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)**

		Indicative Content	Mark
QWC	***(b)**	A comparison including some of the following ideas • Transformers can be used or voltages/currents can be changed/transformed • AC (can transmit) at lower current/high(er) voltage • National Grid is (usually) over ground (DC cables (were) underground) • Less energy lost in transmission • National Grid system can supply to customers further away • Possible to	**(6)** **Exp**

		create a grid linking power stations • More flexibility in voltage for consumer • Consumer can draw large(r) current • More flexibility in power drawn • Great(er) range of devices can be powered Ignore methods of electricity production	
Level	**0**	No rewardable content	
1	**1 - 2**	• a limited (maybe implied) comparison giving one fact e.g: AC can be at high(er) voltage OR the National Grid can supply houses not close to a power station/ further (away/than the New York system.) • 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 comparison including two ideas which may be linked or not eg Nat. Grid can supply whole country and can be used for more appliances (than just lighting). e.g: AC can be transmitted further (than DC) (because it) wastes less energy • 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 comparison including at least three ideas, with at least one direct link between two of them. • e.g. AC can be transmitted further (than DC) because AC can be transformed to lower current/high(er) voltages. OR AC can be transformed to lower current/high(er) voltages. Greater range of devices used. • the answer communicates ideas clearly and coherently uses a range of scientific terminology accurately • spelling, punctuation and grammar are used with few errors	

Total for Question = 12 mark