Question number	Answer	Notes	Marks
5 (a) (i)	substitution into E = V × I × t; rearrangement; correct evaluation to 2 s.f.; e.g. 25 = 4.5 x 0.65 x time (time =) 25 / (4.5 x 0.65) (time =) 8.5 (s)	no mark for formula alone as given in paper correct answers not given to 2 s.f. gain 2 marks only e.g. 9 (s), 8.55 (s), 8.547... (s) etc.	3
(ii)	GPE = mass × *g* × height;	allow rearrangements and standard symbols e.g. GPE = m × *g* × h	1
(iii)	substitution; rearrangement; evaluation; e.g. 5.0 = 0.780 x 10 x height (height =) 5.0 / (0.780 x 10) (height =) 0.64 (m)	 answer of 0.000 64 (m) gains 2 marks only allow 0.641... (m) allow use of g = 9.81 giving 0.65 (m)	3
(iv)	any two from: MP1. energy transferred (to surroundings) as heat / sound; MP2. mass also has KE; MP3. mass of string has been ignored / eq.; MP4. motor not 100% efficient;	 condone energy wasted as heat/sound energy lost to wires/winding in motor	2
(b)	any four from: MP1. current in coil; MP2. (creates) magnetic field around wires / coil; MP3. interaction between this field and field of magnets; MP4. (produces) a force on the wires / coil; MP5. forces on opposite sides of the coil are in opposite directions;	check diagram for force arrows allow coil becoming electromagnet can be shown on the diagram	4

Question number	Answer	Notes	Marks
7	any five from: MP1. determine / measure distance; MP2. determine / measure time; MP3. appropriate measuring instrument for distance OR time; MP4. use a suitable distance / count laps (of known length); MP5. repeat experiment and calculate average; MP6. use of speed = distance ÷ time; MP7. suitable experimental precaution e.g. reaction time considered, time from and to predetermined points;	 allow idea of measuring diameter/radius and calculating distance ignore 'human error' allow mark a start/finish point	5

Total for question 7 = 5 marks