Mark Scheme (Results)

Summer 2023

Pearson Edexcel International GCSE In Physics (4PH1) Paper 2PR

Question number	Answer	Notes	Marks
3 (a)	any three from: MP1. idea that plastic is an insulator OR that metal is a conductor; MP2. idea that charge/electrons are transferred (by rubbing/friction); MP3. charge/electrons remain/build up on plastic parts; MP4. charge/electrons flow through the metal parts/travel to earth;	 allow plastic has no free electrons allow plastic does not conduct allow electrons gained / lost must be clearly linked to plastic must be clearly linked to metal	3
(b) (i)	substitution into energy = charge × voltage; rearrangement; evaluation; e.g. (0.00)5 = charge × 6000 charge = (0.00)5 / 6000 (charge =) 8.3×10^{-7} (C)	ignore unit conversions until evaluation −1 for POT error allow 8×10^{-7}, $8.33... \times 10^{-7}$ (C)	3
(ii)	idea of bringing pad near another uncharged insulator; attraction used to demonstrate charge on sponge;	allow water from tap, (small) pieces of paper, hair, balloon etc. as the insulator allow gold leaf electroscope reject references to repulsion unless linked to gold leaf electroscope	2

Total for Question 3 = 8 marks

Question number	Answer	Notes	Marks
5 (a)	energy required; for a unit mass / per gram (of mass) / per kilogram (of mass); to change per unit temperature / change by 1°(C) / change by 1 K;	ignore equations ignore heat for energy allow other statements that imply changing e.g. increasing, raising, heat up, decreasing etc.	3
(b) (i)	substitution into $\Delta Q = mc\Delta T$; rearrangement; correct evaluation to 2 or more s.f.; e.g. 3500 = 58 × c × [37–21] c = 3500 / 58 × 16 c = 3.8	 answer of 2.9, 1.6, 1.0 gets 1 mark for showing rearrangement allow 3.77...	3
(ii)	any one from: MP1. <u>energy</u> also heating boiling tube; MP2. <u>energy</u> is being transferred/lost to/gained from surroundings; MP3. stearic acid may be impure;	ignore suggestions of human error allow thermometer, support allow alternatives to surroundings e.g. air	1

Total for Question 5 = 7 marks

(v)	any three from: MP1. indication that 1.0 kg is 1000 g; MP2. use of data from table to show that ratio supports 3.0 A current value; MP3. (because) current is (directly) proportional to mass; MP4. idea that 1.0 kg is (far) beyond range of collected data/graph; MP5. idea that pattern may not continue outside range of data collected/graph;	 can be inferred from working e.g. 2×500g = 1kg e.g. 500g gives 1.50A and 1000g is double 500g, 100g gives 0.30A and 1000g is 10 times 100g	3

Total for Question 6 = 12 marks