



Mark Scheme (Results)

November 2020

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

| Question number | Answer | Notes | Marks |
|-----------------|---|--|-------|
| 1 (a) | (i) idea of rubbing / friction; with another insulator; | allow suitable named insulator e.g. duster, cloth, hair etc. | 2 |
| | (ii) C (-0.0052 C); A is incorrect because this is equivalent to -520 mC B is incorrect because this is equivalent to -52 mC D is incorrect because this is equivalent to -0.52 mC | | 1 |
| | (iii) A (the rod has gained negatively charged electrons); B is incorrect because electrons are not positively charged C is incorrect because this would make the rod positively charged D is incorrect because electrons are not positively charged | | 1 |
| | (iv) suitable method of demonstrating; correct observation; | e.g. <ul style="list-style-type: none"> place rod on electroscope place rod near stream of water from a tap place rod near hair place rod above small pieces of paper place rod near another (charged) rod e.g. <ul style="list-style-type: none"> leaf on electroscope deflects water moves towards rod hair moves towards rod paper moves towards rod rods move towards/away from each other | 2 |
| (b) | (i) photocopiers / inkjet printers / smoke precipitators / (electrostatic) spray painting; | allow any correct use | 1 |
| | (ii) risk of a spark; (causing) explosion / fire; | | 2 |

Total for Question 1 = 9 marks

| Question number | Answer | Notes | Marks |
|-----------------|---|---|-------|
| 5 (a) (i) | C (nuclear); A is incorrect because chemical reactions do not happen in the Sun B is incorrect because the kinetic store of particles increases during nuclear fusion D is incorrect because the thermal store of the Sun remains constant whilst fusion is taking place | | 1 |
| (ii) | B (by radiation); A is incorrect because transfers by heating cannot happen in a vacuum C is incorrect because there is no electrical circuit or flow of ions D is incorrect because the transfer does not happen due to forces | | 1 |
| (b) (i) | evaluation of total power / conversion of hours to seconds; evaluation of energy in J; evaluation of energy in MJ; e.g. power = $(1000 \times 15 =) 15\,000 \text{ (m}^2\text{)}$ OR time = $(2 \times 60 \times 60 =) 7200 \text{ (s)}$ energy = $(15\,000 \times 7200 =) 108\,000\,000 \text{ (J)}$ energy = $(108\,000\,000 \div 1\,000\,000 =) 108 \text{ (MJ)}$ | allow $\times 3600$ seen anywhere in working | 3 |
| (ii) | substitution into $\Delta Q = m \times c \times \Delta T$; rearrangement; evaluation of ΔT ; evaluation of final temperature; e.g. $100\,000\,000 = 1100 \times 4200 \times \Delta T$ $\Delta T = 100\,000\,000 / (1100 \times 4200)$ $(\Delta T =) 22 \text{ (}^\circ\text{C)}$ $T = (20 + 22 =) 42 \text{ (}^\circ\text{C)}$ | -1 for POT error allow ECF from incorrect ΔT allow 23.3..., 21.6... allow 41.6-43.8 ($^\circ\text{C}$) | 4 |
| (iii) | any sensible suggestion; e.g. <ul style="list-style-type: none"> heating process is not 100% efficient energy also heats up pipes / not all energy is transferred to water some energy is transferred to the surroundings power of Sun may change | allow energy transferred to (solar) panel ignore 'heat is lost' | 1 |

Total for Question 5 = 10 marks