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| iii | Substitution and rearrangement; Calculation ; $\frac{12}{0.05 \times 1.6}$ 150 (m) | POT error loses 1 mark e.g. 0.15 (m) gets 1 mark | 2 |
| e | any Two from: <ul style="list-style-type: none"> • Value of g lower(on the Moon)/RA; • lack of air resistance (on the Moon)/RA; • Time of flight greater; | ignore <ul style="list-style-type: none"> • 'no gravity' allow <ul style="list-style-type: none"> • less gravity • drag for air resistance | 2 |

(Total for Question 10 = 15 marks)

| Question number | Answer | Notes | Marks |
|-----------------|---|---|-------|
| 12 a | MP1. series circuit containing lamp and some form of power supply; MP2. ammeter in series with lamp; MP3. voltmeter in parallel across lamp; MP4. variable resistor in series OR use of variable power supply; | incorrect symbols or substantial gaps = -1 ONCE allow either symbol for lamp ignore other components e.g. switch | 4 |
| b i | idea that gradient changes; e.g. voltage increases more rapidly than the current | look for a rate change expressed in student terms Accept <ul style="list-style-type: none"> • line is curved • not a straight line • V is not proportional to I | 1 |
| ii | MP1. Lamp heats up; MP2. Greater chance of electron collisions; MP3. (hence) resistance increases; | do not award marks for a description of the shape of the graph | 3 |

(Total for question 12 = 8 marks)