

NAME: .....

**ELECTROSTATICS ANSWERS**

1. (a) (i) An explanation to include:  
 1. **friction** between duster and comb;  
 2. charge transferred in the process/ moved off / pull; 2  
 [Ignore reference to sign of charge]
- (ii) A suggestion to include:  
 1. paper contains charges / paper charged;  
 2. opposite charges;  
 3. **attract(ed) to comb;** 2
- (iii) comb earthed / metals conduct / metals cannot be charged / metal is not charged / charge goes to hand; 1
- (b) (i) An explanation to include:  
 1. diaphragm becomes charged / having positive and negative charges passing through it,  
 2. attracted (repelled) from conductive plates / pushed (pulled) to plates; 2
- (ii) compresses / expands the **air** producing a sound wave vibrates the **air** / causes a movement of the **air**; 1
- [8]**

2. (a) An explanation to include two from:  
 1. movement of fuel through pipes;  
 2. friction with surface of pipe causing charges to be produced;  
 3. electrons transferred between the fuel and the pipe; 2
- (b) spark could ignite the fuel/cause explosion; 1
- (c) An explanation to include:  
 1. copper wire acts as an earth;  
 2. which neutralises any charged object placed in contact with it; 2
- [5]**

3. Ans
- (a) rub it (with a cloth) 1 1
- (b) (i) repel 1
- (j) attract 1
- (iii) attract 1
- (iv) attract 1 4

**Total 5**

4. (a) (i) negative at LH end and positive at RH end B1

(ii) (+ve) charge on A attracts electrons/ -ve charges/ -ve ions  
OR unlike charges attract (ignore reference to + charges) B1  
electrons move to end X/ towards A B1

(unbalanced) +ve charges (left) at end Y NOT repelled to Y B1  
(iii) idea that each electron leaves behind an equal unbalanced proton in nucleus/B has no net charge/B is neutral/idea that B has not gained or lost any charges B1  
(b) (i) nothing OR nothing implied B1  
(ii) +ve charge cancelled/neutralised B1  
by electrons/negative charges flowing up from earth B1

[Total: 8]

5. (a) An explanation to include:  
electrons / negative charge / negative particles;  
transferred / moved from the ruler (to the cloth);      2  
[reject for both marks positives move]

(b) An explanation to include three of:  
(movement of petrol / lorry / tyres) can build up / transfer a charge / static electricity builds up;  
tyres are (good electrical) insulators ;  
they do not allow / stop charge / (static) electricity escaping / transferring to earth;  
spark;  
could cause an explosion / fire;      3  
electricity / charge escapes / transferred from /  
through strip / lorry is earthed / charge goes to earth;

[5]

6. (a) (i) electron/negatively charged particle;      1

(ii) An explanation to include:  
1. causing explosion/fire/ignition;  
2. sparking;      2  
[Ignore references to electrical shock/current]

(iii) pipe could be earthed/charge conducted away safely;  
[Accept 'rubber' conductivity strip]      1

(b) An explanation to include:  
1. granules have like charges;  
2. like charges repel;      2

[6]