

Gr 11 Test Oct 2020 Blue MEMO

- 1.1 D
1.2 D
1.3 A
1.4 B
1.5 D

2.1 The electrostatic force between two charges is directly proportional to the product (of the magnitudes) of the charges and inversely proportional to the square of the distance between their centres. ✓✓

2.2
$$F = \frac{kQ_1Q_2}{r^2} = \frac{(9 \times 10^9)(15 \times 10^{-9})(2 \times 10^{-9})}{(0,75)^2} = 4,8 \times 10^{-7} \text{ N}$$

- 2.3 ✓ correct pattern / lines perpendicular to surface and curling
✓ correct direction of field lines

2.4
$$E = \frac{kQ}{r^2} \ddot{u}$$

$$E_{net} = E_P + E_Q \ddot{u}$$

$$E_{net} = \frac{(9 \times 10^9)(15 \times 10^{-9})}{(0,95)^2} \ddot{u} + \frac{(9 \times 10^9)(2 \times 10^{-9})}{(0,2)^2} \ddot{u}$$

$$E_{net} = 6 \times 10^2 \text{ N} \cdot \text{C}^{-1} \text{ to the right } \checkmark$$

(ACCEPT: 599,58)

2.5
$$E = \frac{F}{q} \checkmark$$

$$6 \times 10^2 = \frac{F}{1,6 \times 10^{-19}} \ddot{u}$$

$$F = 9,6 \times 10^{-17} \text{ N to the right } \checkmark$$

(ACCEPT: $9,59 \times 10^{-17}$)

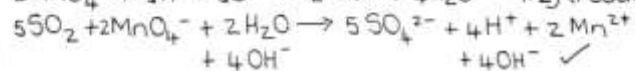
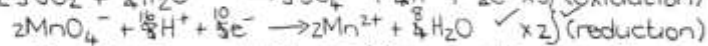
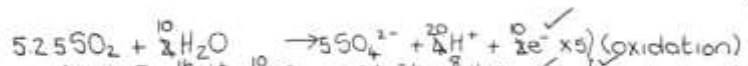
4.1 OH^- accepted a proton to form H_2O .

4.2 Na_2SO_4 ✓

4.3 water ✓ (not H_2O)

4.4 H_2SO_4 ✓
 H_2O ✓ (6)

5.1 Reduction: decrease in oxidation number



5.3 SO_2 ✓ (8)

5.1 Ohm's law: the potential difference is directly proportional to the current strength ✓ at constant temperature ✓

5.2 The energy per charge transferred between two points in a circuit ✓ ✓

$$5.3.1 \quad R_p = \frac{R_1 \times R_2}{R_1 + R_2} \quad \checkmark = \frac{15 \times 25}{15+25} \quad \checkmark = 9,375 \Omega \quad \checkmark$$

$$5.3.2 \quad V = I R \quad \checkmark$$

$$50 = I (45) \quad \checkmark$$

$$I = 1,11 \text{ A} \quad \checkmark$$

$$5.3.3 \quad I_{10\Omega} = 1,11 \times \frac{15}{40} \quad \checkmark = 0,416 \text{ A} \quad \checkmark \quad \text{OR using } V = I R$$

5.3.4 V increases ✓

5.3.5 R_{tot} decreases ✓, thus I increases, and $V \propto I$ ✓

5.3.6 B and C equally bright ✓, A brighter than B and C ✓

$$5.4 \quad \text{Cost} = \text{kW} \times \text{h} \times \text{unit price} \quad \checkmark$$

$$38,13 \quad \checkmark = 2 \times \frac{18}{60} \times 31 \quad \checkmark \times \text{unit price}$$

$$\text{Unit price} = \text{R}2,05 \quad \checkmark$$