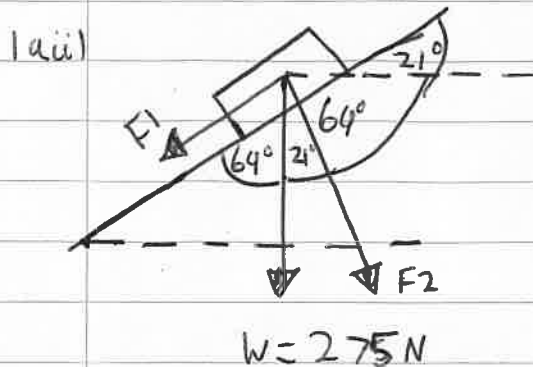


Science Coursework

1ai) magnitude of friction $= 275 \cos(69) = 98.55 \text{ N}$



The angle between the direction of the force of friction and the vertical $= 111^\circ$

1d iii) Normal reaction between the box and plane $= 275 \sin(69) = 256.73 \text{ N}$

1b ii) momentum $= \text{kg m/s}$

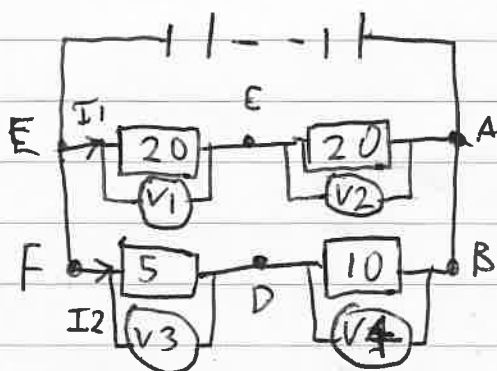
2ci) $275 \div 9.81 = 28.03 \text{ kg} = \text{mass}$ Resultant $= \text{mass} \times \text{acceleration}$
force

2cii) $28.03 \times 7.5 = 210.225 \text{ ms}^{-1}$ $70.075 = 28.03 \times 2.5$

2ciii) $5 \times 12.5 = 62.5 \div 3.2 = 19.53 \text{ N}$

3ai) $\frac{1}{R_T} = \frac{1}{R_1} + \frac{1}{R_2}$ $\frac{1}{40000} + \frac{1}{15000} = \frac{11}{120000}$ $\frac{120000}{11} = 10909.09$

3aii) $V = IR$ $I = \frac{V}{R} = \frac{12}{10909.09} = 1.1 \times 10^{-3}$



3aiii) Power $= \text{Current} \times \text{Voltage}$
 $P_1 = 3 \times 10^{-4} \times 6 = 1.8 \times 10^{-3} \text{ W}$
 $P_2 = 1.8 \times 10^{-3} \text{ W}$
 $P_3 = 8 \times 10^{-4} \times 4 = 3.2 \times 10^{-3} \text{ W}$
 $P_4 = 8 \times 10^{-4} \times 8 = 6.4 \times 10^{-3} \text{ W}$