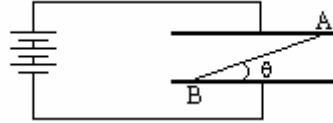


## UNIT 7 EXERCISES

1) A capacitor is connected to a 120V battery as shown in the following diagram. A very high resistance wire is then inserted, connecting point A and B on the plates.



The potential difference between the ends of the wire will then be

- (i)  $120 \cos \theta \text{ V}$       (iv)  $120 \sin \theta \text{ v}$
- (ii)  $120 \text{ V}$               (v)  $\frac{120}{\cos \theta} \text{ V}$
- (iii)  $\frac{120}{\sin \theta} \text{ V}$       (vi)  $\tan \theta \text{ V}$
- (vii) None of the above; once the wire has been inserted, the potential difference cannot be determined.

2) A pacemaker sends a pulse to a patient's heart every time the capacitor in the pacemaker charges to a voltage of 0.25V. It is desired that the patient receive 75 pulses per minute. Given that the capacitance of the pacemaker is  $110 \mu\text{F}$  and that the battery has a voltage of 9.0V, what value should the resistance have? Show your work.

3) The current flowing through the  $8.45 \Omega$  resistor in the diagram below is 1.22A.

- (i) What is the voltage of the battery? Explain your reasoning.
- (ii) if the  $17.2 \Omega$  resistor is increased in value, will the current provided by the battery increase, decrease or stay the same? Explain your reasoning.
- (iii) If the current through the  $13.8 \Omega$  resistor is 0.750A, find the current in the other resistors in the circuit. Show your work.

